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STATISTICS

OF

COAL IN ILLINOIS

1887.

A SUPPLEMENTAL REPORT

OF THE

STATE BUREAU OF LABOR STATISTICS

CONTAINING THE ANNUAL

REPORTS OF MINE INSPECTORS.

JOHN S. LORD, SECRETARY.

SPRINGFIELD, ILL.:
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1887.

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COAL IN ILLINOIS.

This is the sixth annual compilation of the statistics of coal mines and coal mining in Illinois. These reports are based upon, and include, the annual reports of the State inspectors of mines, who are required to make both textual and tabular statements as to the mines which come under their observation, and concerning all the details of situation in their respective districts. From the data thus obtained summaries are annually compiled for the whole State and published with such commentaries as the facts suggest.

In this way a permanent record has been made for the years since this bureau and the inspection service were established, of the development of the mineral resources of the State, the progress made in mining methods, the improvement in sanitary conditions, and safety appliances, the fluctuations in values and wages, and some of the struggles involved in establishing the latter.

In detail, this, and former reports present a great variety of statistics, embracing a physical description of every mine, with the names of proprietors, the amount of coal produced, the number of men and animals employed, the number of days worked, the amount of powder used and the casualties of all kinds which have overtaken those engaged in this hazardous business.

The present report also includes an account of the recent public examination held for testing the qualifications of those who were candidates for appointment as mine inspectors, with a list of the questions submitted to them and the answers to the same.

THE RECORD OF 1887.

The most noticeable and note-worthy fact developed by the summaries for this year is that a marked improvement is shown in the volume of business done. This is the more gratifying in view of the fact that for the two preceding years there had been a decline in the total tonnage for the State. For the past year however, the aggregate output has been 10,278,890 tons, which is somewhat more than a million tons over the product of the preceding year, and in fact, a greater tonnage than has ever before been recorded for the State. This indicates a reaction, and a revival of business, which later observation shows is probably to continue through the coming year. The present outlook (October, 1887,) is favorable to a large business, the demand for men and for transportation being in excess of the supply in all quarters.

Another feature of last years record is a slight improvement in the prices paid to miners. Averaging all the prices paid for mining, on the basis of the number of tons mined at each price, we obtain an average for the State of 5 cents a ton more than the corresponding average for the year before. The average value of coal at the mines, however, has continued to decline, though but slightly during the last year, the figures being $1.085 per ton for last year, and $1.11 for the year before. The total number of men employed will be found to have increased somewhat, and the average period of active operations for all mines engaged in the business continuously, has increased from 206 to 213.2 days for the year.

Two conspicuous movements looking to the further development of coal have characterized this field for the year under consideration. One is the projection of a new line of railroad by the Chicago, Burlington and Quincy Company from Streator, northwest, through LaSalle, Peru and the Bureau County fields to a point on their Clinton branch, which will give that company not only access to additional coal territory, but a direct and short haul to the great markets of the northwest. The presence of this line in the territory which it occupies is significant of still further activity in a quarter where the coal interests are already large and the operators aggressive.

In the central part of the State also, a new railroad has stimulated a new development of coal in a most prolific field. The St. Louis and Chicago Railroad, at present completed only between Litchfield and Springfield is rapidly pushing its line into the Mt. Olive region, where a large body of land has been secured and several shafts are being sunk by a company contemplating business relations with the new road. The coal deposits at this point are justly regarded as among the most valuable in the State. The seam is about 400 feet deep, from eight to nine feet in thickness, level, dry and uniform: the coal is dense, strong, and easily worked with pick or machine, free from irregularties and impurities, and it lies between a good top and a good bottom. A somewhat better price is claimed for it than for other Illinois coals, in the market, and if it is not always received it readily commands a preference over others at the same price. The reputation of this coal both in the Chicago and St. Louis markets has already been established by the three mines now owned by the Consolidated Coal Company, of St. Louis, and located upon the Wabash, St. Louis and Pacific Railroad. The significance of the new openings lies in their identification with the new railroad, which if it becomes a through line will necessarily develope, and be developed by, the great mineral resources of this field.

There has been very little interruption of business during the year occasioned by strikes. The movement on the part of the principal operators in the north half of the State, and of those in other States, leading to inter-state conferences between themselves and the representatives of the National Federation of Miners, anticipated and adjusted the complications which might otherwise have arisen. The undertaking was a serious one, owing to the diversity of interests at stake, but the disposition to subordinate other considerations to the one object of establishing permanent and pacific relations, was conspicuous throughout, and resulted in an agreement upon a scale of prices substantially acceptable to all. In addition to this the readjustment of affairs in all the territory tributary to St. Louis, which followed the organization of the Consolidated Company, the disposition to introduce the machine system, and the prospect of steady work, combined to preserve the peace among the miners of that district. For the remainder of the State, operators and men have for the most part been able to agree upon terms for mining without serious friction.

The prolonged strike at Grape Creek has not been settled and is now a year and a half old. The Miners' Protective Association has supported and is still maintaining the men who refused to work at this place for less than the scale price. The Association has thus persistently sustained these men in pursuance of its pledges in convention, to require all operators to pay the prices there established, so far as it lay in the power of the Association to do so. The Grape Creek Company has since been operating their mine with other than union men, though under many difficulties, and not without serious impairment of their output.

It is by no means certain, however, that this general condition of harmony will continue to prevail. There are at present indications of a wide-spread movement both among the hand-miners and machine operatives for an advance in prices, based upon the improved condition of the markets. If an issue should be made on this point the fair prospects of the season may yet be neutralized.

The operators in some portions of the State have been seriously embarrassed during the summer by the long continued drought. In some parts of Madison, Macoupin and St. Clair counties, and even as far north as Minonk, in Woodford county, water has been so scarce that many operators have been obliged to transport by rail the entire supply for their boilers. Even reservoirs for the accumulation of surface water which had formerly afforded an abundant supply have become exhausted and in some instances new and larger ones have been excavated as permanent features of the mine equipment. Many wells have been sunk at other places with but indifferent success. This dearth of water still continues, no rain of sufficient volume to afford relief having as yet fallen. The reservoirs and wells are still dry, and trains of tank-cars are still running to and from these desert places transporting water, and thus augmenting by tens of thousands of dollars the normal cost of coal production in the affected districts.

With this glance at the general situation we present the following statistical summaries of the business actually done during the year.

Number of counties reported	49
Number of mines and openings of all kinds	817
Number of tons of coal mined	10,278,890
Aggregate value of the same at the mines	$11,152,596
Average value per ton at the mines	$1,085
Number of employés of all kinds	26,804
Average number of days of active operations	213.2
Average price paid per ton for mining	$0.727
Number of kegs of powder used	152,627
Number of mules employed under ground	1,474
Number of men killed	41
Number of men injured so as to lose time	180
Number of tons mined for each life lost	244,735
Number of employés for each life lost	409

THE NUMBER OF COAL PRODUCING COUNTIES.

The whole number of counties which appear as producers of coal this year is 49 out of a total in the State of 102. There are 52 counties in all from which coal has at some time, and in greater or less quantities, been reported, but three of them have not contributed to the output of the State this year. These are Edgar, Jasper and Calhoun Counties. Edgar county has only one mine, located at Illiana, on the Indiana State line, and this has not been in operation during the year, though there is still an abundance of mineral in sight. The coal and coke plant at Thomas' Landing, on the Mississippi river, in Calhoun county, has been idle for a number of years, and is apparently abandoned. Jasper county also fails this year to contribute its small quota of the fuel supply, owing to the suspension of its one unimportant mine. A subsequent table will show the whole number of counties in which coal has been developed and also the quantity and local value of the mineral produced in each county for a series of years.

THE NUMBER AND CHARACTER OF MINES.

The whole number of mines and openings of all kinds for the working of coal is somewhat larger this year than heretofore, though the numerical increase is largely in mines of trifling importance. Our summary shows a total of 817 places at which coal is produced, but of these 9 are so-called "strippings," and 7 are mines at which for various reasons no coal has been mined during the year. Omitting these, and there remain 801, as to which we have a specific product reported, and which may be subjected to classification upon that basis. Of these, 64 have produced 50,000 tons or more during the year, 139 have produced from 10,000 to 50,000 tons, 278 from 1,000 to 10,000 tons, and 320 less than 1,000 tons. A similar classification of the mines of the State has been made in former reports for a number of years, and to further indicate the diversity in the output of the mines which are embraced in our totals, the results of former analyses are tabulated as follows for a period of five years.

Years.	No. of mines producing less than 1,000 tons ...	No. of mines producing from 1,000 to 10,000 tons ..	No. of mines producing from 10,000 to 50,000 tons	No. of mines producing over 50,000 tons	Totals.
1883...................................	209	233	135	62	639
1884...................................	262	273	146	60	741
1885...................................	286	290	139	63	778
1886...................................	316	280	136	57	787
1887...................................	320	278	139	64	801

This division is made not upon the capacity but the actual output of the mines as reported for the several years, and it follows that a plant of large capacity may appear in a lower class than it should, if it has not, for any reason, been worked approximately to its capacity. In general, however, these arbitrary divisions upon the basis of output afford a very good indication of the relative importance of the whole number of mines.

It is of course noticeable that a very small proportion of the whole number are in the first class, or those whose product has been 50,000 tons or more. An examination, however, of the actual business of the 64 mines reported in this class for 1887, shows that their aggregate product was more than half the whole, or 5,949,894 tons, which gives an average of 100,608 tons to each. Similarly it is found that the 139 mines of the second class, producing from 10,000 to 50,000 tons in the year, show a total output of 3,270,681 tons. Thus the two classes numbering 203 mines produce an aggregate of 9,220,675 tons, or in round numbers one-fourth of the whole number of mines delivers 90 per cent. of the entire product of coal.

The largest output of any one mine for the year is that of the C., M. & St. P. shaft No. 2, at Braceville, which raised 274,711 tons; the No. 1 shaft of the C., W. & V. Coal Co., at Streator, is next in rank with an output of 241,508 tons, and this is followed by the St. Louis Ore and Steel Co.'s mine at Murphysboro, which shows a total of 215,690 tons.

The relative magnitude of the business of the great coal companies is as follows: The Consolidated Coal Co. of St. Louis which owns and controls 71 mines in Illinois, reports as the product of 54 of them 2,008,341 tons. This, however, does not represent a full years, operations, in point of time, as the organization of the company was not completed until September, and 17 of their acquired mines were not operated at all. So that the above output may be regarded as the work of three-fourths of their mines for 10 months of the year.

The Chicago, Wilmington and Vermilion Coal Co. has 4 mines at Braidwood and 3 at Streator, and reports as the product of these 7 establishments a total of 851,308 tons.

The Spring Valley Coal Co. near LaSalle, has had 3 mines in operation during the year with a total output of 351,985 tons. Another mine will shortly be opened by this company, and still others as rapidly as the work can be advanced. Among the smaller companies may be mentioned, the Wilmington Star Coal Co., with

2 mines and an output of 115,645 tons; the LaSalle County Carbon Coal Co. with 2 mines and 107,250 tons; the Sangamon Coal Co., Springfield, 3 mines, and 140,182 tons; the Grape Creek Coal Co. 4 mines and 82,320 tons, and the Coal Valley Coal Co., Rock Island, with 2 mines, and a product of 73,469 tons, though this is practically the output of only one of them.

Mr. Taylor Williams, a large individual owner, has had five mines in operation during the year whose product has been as follows: At Clark City, 87,000 tons, Gardner, 43,000 tons, St. David 24,039 tons, Rapids City 36,199 tons, Cleveland, 9,968 tons, the total being 200,206 tons.

These memoranda sufficiently indicate what proportion of the 801 mines here reported really furnish the commercial product of the State and equally distinguish some, though not all of the principal producers and shippers.

There are of course new mines being opened each year and mines being exhausted or for other reasons abandoned. An enumeration of these shows that numerically they have nearly offset each other, the whole number of new mines for the year being 60, and the number of mines closed being 54.

The Output of the Year.

The aggregate product of all the mines in the State for the year ending July 1, 1887, has been 10,278,890 tons.

This is a marked increase over the output of any recent year, and is in fact a larger total by 178,886 tons than the State has ever before produced in one year. In both the years 1883 and 1884 the total reached ten millions of tons, but in the following year 1885, the output declined in volume to 9,791,874 tons, and in 1886 to 9,246,435 tons. The increase over last year is consequently somewhat more than a million tons. It is made up in the following districts. In the First district, including the Streator, LaSalle and Braidwood fields there has been a gain of 360,087 tons; in the Second district a gain of 364,304 tons, chiefly arising from the further developement of the Spring Valley fields; in the Third district embracing Peoria, Fulton, Vermilion and intermediate counties, the gain has been 262,950 tons, and in the Fifth district which takes in the St. Clair and southern fields, the increase has been 226,636 tons. But in the Fourth district, including among others the great coal counties of Sangamon, Macoupin and Madison, there has been a decline in output of 181,522 tons. This has occurred principally in Macoupin county where ten of the mines recently acquired by the Consolidated Coal Co., show a falling off of 165,017 tons as compared with their output for the preceding year. For the last four years the Fourth district has stood at the head of the list in coal products, though its tonnage has been declining each year since 1883, when it had attained a maximum of 3,128,368 tons. Now it yields the first place to the First district which shows the largest output of all the districts, and the largest it has ever had. There is moreover, every probability that this supremacy will be maintained in the future, as the new branch of the C. B. & Q. railroad already referred to as being constructed across this prolific territory, affording a new and direct outlet to the northwest, is already stimulating new coal enterprises, and will doubtless continue to do so.

This will especially add to the magnitude of the industry in LaSalle county. There is naturally a greater variance between counties as to the richness of their coal deposits, and the extent to which they are developed, than between districts. Three counties have alternately enjoyed the distinction of being the greatest producers of coal; these are LaSalle, St. Clair and Macoupin. For a period of six years the aggregate of coal raised in each of these counties has not varied greatly from a million tons. In 1882 LaSalle county was foremost with an output of 1,169,030 tons; in 1883 and 1884 Macoupin county produced the most, the totals being 1,233,200 and 1,164,409 tons respectively; in 1885 St. Clair county took the lead with a total of 1,202,549 tons; in 1886 Macoupin county again acquired the ascendancy with 1,085,539 tons, and this year LaSalle county has the precedence with 1,125,235 tons.

The six counties which rank next to these are Grundy with 792,954 tons; Sangamon with 730,391; Madison with 521,705; Peoria with 452,123; Jackson with 375,718 and Vermilion with 359,119. The aggregate of all coal mined in this State for a period of seven years as shown by the records of this office has been 64,680,225 tons.

Value of Coal at the Mines.

The average value of this staple product at the mines, for the State at large and for the year, is found to have been $1.085 per ton. The basis for this deduction is the average value given by each proprietor for his coal on track at the mine. Being an average it does not purport to indicate exact prices received, which in some localities vary very widely, as between contracts for large amounts, and the prices charged to private consumers. But for purposes of comparison and general deduction the average reported from year to year afford a relatively true index of real values. The average for the State as deduced for the year past is somewhat less than for the preceding year, or for any other year. Computations for this average for a series of years give the following tabular statement:

Average Value of Coal per ton (of 2,000 pounds) at the Mines.

Districts.	1882.	1883.	1884.	1885.	1886.	1887.	Percentage of decline.
First	$1 75	$1 59	$1 49	$1 41	$1 32	$1.316	25
Second	1 87	1 97	1 79	1 71	1 57	1.497	20
Third	1 43	1 45	1 31	1 25	1 16	1.095	24
Fourth	1 33	1 32	1 09	.985	.969	.887	33
Fifth	1 31	1 26	.961	.894	.862	.823	37
The State	$1 51	$1 48	$1 26	$1 17	$1 11	$1 085	28

These averages are in each instance obtained by computations involving the number of tons produced of each given value, and are calculated successively for counties, for districts, and for the State.

The somewhat remarkable fact is here developed that the operators of mines are now receiving from one-quarter to one-third less for their product than they were in 1882,—the decline by districts being from 20 to 37 per cent. with an average of 28 per cent. for the whole State. This decline has moreover been continuous during the term, each year showing a smaller average than its predecessor, though the variation this year is slighter than in former years.

This, and the further fact that there has been during the year a slight improvement in the prices paid to operative miners, indicates that the limit of depression must have been reached.

Various causes are readily assignable for the decline which is here shown. Primarily no doubt it has been occasioned by the excess of capacity in our mines over the actual demand for consumption. There are not only more mines than enough, both in this and other States, but usually each one is projected with a view to indefinite expansion, and the owners at once enter the race for a maximum business in order to reach a minimum in the cost of production. This intensifies competition, and in itself is sufficient occasion for gradually declining prices, but the most potent and active agency for affecting a reduction in the cost of production, so far as it is represented by the wages of miners, has undoubtedly been the introduction of the mining machine and the system which accompanies it. This has been the last resort of all the large companies in their efforts to underbid each other. It has reduced the price of hand-mining to a point which could not otherwise have been reached, and has thus made it possible to reduce the average selling price of coal from $1.51 to $1.085 per ton, and this without materially checking new enterprises or retarding the volume of business. Part of this shrinkage has undoubtedly come from the profits of the business which were formerly larger than now; part of it has also been taken from the wages of employés, and the remainder represents the gains which have been made through improved methods and more economical management.

THE NUMBER OF EMPLOYÉS.

As should be expected in view of the increased tonnage for the year the total number of employés engaged in this industry has also been somewhat larger than formerly. It is customary each year to call for the number of miners employed in summer and the number in winter at each mine, and the number of other employés in and about the mines, not including those engaged in office or clerical work. Last year the number of miners employed in summer was 14,129, in winter, 20,973, and of other employès 4,873, making a total in the winter or busy season, usually conceded to be about eight months of the year, of 25,846; and the year before that the total was about the same. This year we have for the summer 15,066 miners, for the winter 21,158, and of others 5,646, making a maximum number of 26,804. In this summary the men engaged in operating machines are reported as miners, though many of them are not and never have been practical miners, capable of cutting, drilling, blasting and timbering with the ordinary implements of the craft. In future, however, in view of the changes being wrought by the machine system, a separate enumeration will be made of those working the coal by hand and those operating the machines.

In mining, perhaps more than in any other industry, there is a tendency to congregate a surplus of men about every establishment. This is important to the proprietor because the coals of this field can not be mined and stored profitably in anticipation of future demands, but must be produced daily in quantities to supply the current need. It thus happens that there are frequent emergencies requiring the services of many more men than can be employed continually, and while it is well that the operator should be able to command men for such occasions, it is not so well for the miners, who must remain more or less idle for long intervals in the dull season. An illustration of what a given number of miners can accomplish when kept continuously and regularly at work is found at the mine of the Mattheissen and Hegeler Zinc works, at La Salle. This establishment consumes the entire product of its mine in the manufacture of zinc; and the quantity required is substantially uniform for every working day in the year. Under these conditions 46 miners deliver from a five-foot seam an average of 240 tons a day, or 74,310 tons in a year of 310 working days, which gives an average of 1,615 tons a year to each man, which at 55 cents a ton gives to each an average annual income of $888.25, or $74.00 a month.

On the other hand there is reported at twelve other mines in La Salle county, working from three to five feet of coal by hand, an average of 1,713 miners, whose aggregate product is 893,078 tons, or 521 tons to the man, which at an average of 84 cents a ton gives them an average of $437.64 per annum. This also shows how the smaller sum per ton may be the better pay. The coal at the zinc works is not screened, and the gross weight of the contents of each pit-car is credited to the miner, while at the other mines, with one exception, the coal is screened first and weighed afterward. This of itself would not, however, make the whole difference between 55 cents and 90 cents a ton to the miner. At a neighboring mine 77½ cents a ton is paid for coal from a three-foot seam weighed before screening, indicating that the gain from that source is equivalent to 12½ cents a ton. But the great advantage a miner enjoys in a place at the works of Matthiessen and Hegeler consists in the regularity of the work, and if this firm were disposed to take the utmost advantage of their situation, they could doubtless fill their mine with men at 45 cents a ton, while others offering less regular work were paying 90 cents.

In ten large hand-mines in Grundy county, an average of 1,919 men produce 776,762 tons, or an average of 406 tons each, for which they receive 95 cents a ton, or $384.75 each per annum. This is for work in a three-foot seam. In Sangamon county an average of 1,055 men working in a five-foot seam, mine 730,391 tons, or 700 per man, which at 55 cents a ton would give the miner an average of $375. In St. Clair county the reported number of men compared with the tons mined shows a product of about 600 tons to the man, at 50 cents a ton. At Spring Valley 633 men mine 351,985 tons, or 556 to each in a three-foot seam, and at 90 cents a ton, making average earnings of $500.

These cases are given not so much for the purpose of showing the average earnings at different places, for the enumeration of employés is not accurate enough to predicate anything more than a generalization upon, but more especially to emphasize the paramount importance to the miner of steady work. It appears that with full opportunities a miner can make 1,600 tons of coal per annum in a five-foot seam working pillar-and-room by hand, while with such opportunities as they can get in ordinary shipping mines, dependent upon a fluctuating market, they average at most 600 or 700 tons per annum. In other words the number of men actually engaged in and dependent upon the industry is about twice as great as the number really required to produce the present output if they could all work all the time.

WORKING TIME.

This leads to the subject of average working time for the year, as derived from the reports of the number of days of active operations at each mine. In our subsequent table of summaries a level average of days worked by each of all the mines, of all sizes, is given as 183.8 days in the year. But as already shown, much the larger number of mines are of comparatively trifling capacity, and their operations are confined to the winter months. In order therefore to arrive at the average working time of those mines which are carried on continuously throughout the year, a division is made upon the class known as the shipping mines. We thus obtain a list of 292 mines, the whole number being 297, and these we find have in fact given employment to 23,146 men, or 86 per cent. of the whole, and have brought to the surface 9,655,811 tons of coal, or 94 per cent. of the entire product. Applying the calculation to these, as truly representing the industry as a permanent and continuous business, we find that these mines have been in active operation during the year an aggregate of 62,248 days, from which we deduce the average of 213.2 days as the average working time of each, and 68.7 per cent. as the proportion of full time which has been devoted to the active prosecution of this business. The average working time, similarly computed for last year was 206 days.

Carried somewhat further these figures indicate an average daily product of 4,529 tons, and an annual product per miner of 523 tons.

THE PRICES PAID FOR MINING.

The average prices paid per ton for hand-mining in the various districts, and for the State during the year and for five years, are shown in the following table.

Average Prices paid for Mining in the Five Districts and the State, for Five Years.

DISTRICTS.	1883.	1884.	1885.	1886.	1887.	Decline.
First	$0.917	$0.906	$0.867	$0.859	$0.891	3%
Second	.983	1.00	.941	.927	.927	6%
Third	.875	.873	.814	.729	.688	21.5%
Fourth	.71	.694	.62	.573	.576	19%
Fifth	.619	.60	.511	.501	.537	13%
The State	.802	.783	.725	.676	.727	6.4%

These sums are the amounts obtained by computations involving the number of tons mined at each given price in each county and district, and are in fact the quotients arising from a division of the whole sum paid for mining by the number of tons mined.

The resultant average is thus modified in proper degree by the price paid at each mine, and for the two seasons, summer and winter, and by the number of men employed. Upon this basis the State average has been computed for five years with the results given, and while they may possess only the value of an abstract generalization, they afford a mathematical exponent of the tendency and degree of change in prices for the term given.

The decline is seen to have been continuous and considerable up to the year under consideration, the lowest price being 15.7 per cent. less than the highest. During the last year some improvement is shown, the State average being 5.1 cents per ton greater than for the year preceding. This gain has been principally in the First and Fifth districts, in both of which, causes have been at work which account for the change. In the First district an advance was secured chiefly through the agency of the Miners Protective Association in bringing about conferences between the miners and operators of several States. In the Fifth district the influence of the consolidation of many mines under the management of one company has been to remove a great deal of disastrous competition and establish a permanent rate somewhat better than the average of the many prices paid before at the same mines. In the Third district alone the price of mining has suffered a general decline equivalent to 4.1 cents per ton.

As shown in a former table the average value of coal at the mines for the State at large has declined somewhat during the year, though but slightly, and has declined continuously for six years, a total of 28 per cent. The following table shows the relative movements of the prices of coal and the prices of mining for a period of five years.

Average Values of Coal and Average Prices for Mining for Five Years in Five Districts and the State.

DISTRICTS.	1883.		1884.		1885.		1886.		1887.		PERCENTAGE OF DECLINE IN	
	Average value of coal...	Average price of mining.	Average value of coal...	Average price of mining.	Average value of coal...	Average price of mining.	Average value of coal...	Average price of mining.	Average value of coal...	Average price of mining.	Coal.	Mining.
First	$1 59	$0 91 7	$1 40	$0 90 6	$1 41	$0 86 7	$1 32	$0 85 9	$1 31 6	$0 89 1	17	3
Second	1 97	98 3	1 79	1 00	1 71	94 1	1 57	92 7	1 49 7	92 7	24	6
Third	1 45	87 5	1 31	87 3	1 25	81 4	1 16	72 9	1 09 5	68 8	25	21.5
Fourth..............	1 32	71	1 09	69 4	98 5	62	96 9	57 3	88 7	57 6	33	19
Fifth	1 26	61 9	96 1	60	89 4	51 1	86 2	50 1	82 3	53 7	35	13
The State	1 48	80 2	1 26	78 3	1 17	72 5	1 11	67 6	1 08 5	72 7	26.5	9.4
Ratio of value of coal to price of mining.	54%		61%		62%		61%		66%			

This shows an average decline in the selling price of coal, or in its reported value on track at the mines of 26.5 per cent., and a decline in the prices paid for mining as reported by proprietors of mines of 9.4 per cent. The ratio which the price paid for mining sustains to the value of product, is also here brought out, and it appears that an increasing portion of the value of the coal is being paid to miners. That proportion has increased from 54 per cent. in 1883, to 66 per cent. in 1887. In other words the average price paid per ton to hand-miners for reducing the mineral to merchantable form is now two-thirds the average value of the coal on track.

At the average price paid for mining, 72.7 cents per ton, we should have as the gross sum paid out for the delivery of 10,278,890 tons of coal on pit-cars at the face of the workings, $7,472,753.75. At the reported average value of the same per ton on track, or ready for market, viz: $1,085, we have as the aggregate value of the entire product the sum of $11,152,593, leaving $3,679,843, or 35.8 cents per ton to cover all the expenses, profits and hazards of the business. Both the expenses, however, and the risks of mining vary so widely, owing to natural conditions, locations and methods that a mathematical conclusion of this kind may have only a general, and in no case a specific application.

THE STATISTICS OF POWDER.

The use of blasting powder in the various processes of coal mining constitutes such an important factor in the economy both of the miner and the operator that for several years statistics have been taken of the quantities of this explosive consumed. This fact is procured for all mines where powder is used in any considerable quantities, and the subsequent tables by counties will show the reported kegs of powder used at each. This class of facts is, however, of more special interest when collated for those mines in which powder must be used and paid for by the miner. We consequently summarize the results taken as to 414 mines in which coal is worked upon the pillar-and-room system and by hand. The long-wall mines are necessarily omitted as under that system the coal is brought down without the aid of explosives, and the machine mines are omitted because the companies in such cases furnish the powder; also many small mines where the seam is of such a nature that the coal can be wedged down. This leaves 414 mines whose total product is about 70 per cent. of the entire output of the State upon which to formulate the record of powder consumption in the various seams and districts. The result is presented in the following table:

Consumption of Powder 1887.

DISTRICTS	COUNTIES.	No. of mines	No. of men	No. of tons mined.	No. of kegs used	No. kegs per man.	No. of tons per keg
First	LaSalle	11	1,016	657,296	5,454	5.3	120.5
	Livingston	12	780	357,600	2,595	3.3	137.8
Second	Bureau	10	114	32,939	310	2.7	106.3
	Henry	3	37	12.788	312	8 4	40 9
	Knox	1	14	3,101	25	1.8	124
	Marshall	12	26	3,760	57	2.2	66
	Mercer	16	388	126,288	5,202	13.4	24
	Rock Island	16	221	82,880	2,403	10.8	34.4
	Schuyler,	5	53	20,246	837	15.8	24.1
	Stark	8	32	9,828	113	3.2	86.9
	Warren	4	13	4,100	76	5.8	53.9
Third	Fulton	42	587	304,588	10,714	18.2	28.4
	Logan	3	197	159,000	4,766	24.1	33.3
	Menard	10	204	155,621	5,781	28.3	26.9
	Peoria	67	774	434,900	19,600	25.3	22.1
	Tazewell	9	109	51,607	2,747	25.1	19.5
	Vermilion	45	722	345,464	7,962	11	43.3
Fourth	Bond	2	49	36,076	1,070	21.8	33.7
	Christian	1	107	149,973	661	6.1	226.8
	Macon	1	27	17,500	900	33.3	19.4
	Macoupin	15	1,142	914,894	11,858	10.3	77
	Madison	10	503	460,926	4,184	8.3	110.1
	Morgan	1	9	3,769	92	10.2	40.9
	Sangamon	16	992	730,391	28,008	28.2	26
	Scott	1	28	8,512	302	10.7	28.1
Fifth	Clinton	2	75	55,238	462	6.1	119.5
	Jackson	8	377	311,279	3,123	8.2	99 6
	Marion	5	206	98,915	3,015	14.6	32.8
	Perry	13	511	319,552	7,824	15.3	40.8
	Randolph	10	161	72,263	1,926	11 9	37.5
	Saline	6	120	78,955	1,867	15.5	42.2
	St. Clair	40	1,250	915,827	12,003	9.6	76.2
	Washington	3	63	40,220	1,386	22	29
	Williamson	6	134	106,338	2,485	18.5	43.5
	Totals	414	11,044	7.082,574	150,129	13.5	47.1

Here is given the distribution of a total of 150,129 kegs of powder. The total for all mines as shown in our preceding summaries is 152,627 kegs. The general statement embodied in this table is that 11,044 miners in 414 mines have consumed 150,129 kegs of powder of 25 pounds each in producing a total of 7,082,574 tons of coal, which is equivalent to an average of 13.5 kegs to each man, and 47.1 tons of coal to each keg. But the specific information conveyed is of more value than the generalization; as, by comparison, the differences in respect to the quantities used in various places are thus more forcibly presented. In one case for instance, there is an average of 226 tons of coal produced for each keg of powder used, while in others the average is as low as 19 or 22 tons per keg, and all the others vary between these extremes; and so in regard to the expense incurred by miners for powder, the range of kegs per man in different counties is from about two, to 33 kegs per man per annum, making a difference to the miner in these localities of from $75 to $100 for this one item. This is very important sum to the miner, and the relative cost of powder at different places is entitled to a consideration in fixing wages which it does not always receive.

THE KILLED AND WOUNDED.

The record of this hazardous business for the year is marred throughout as usual by violent deaths and personal injuries to those engaged in it. It is inevitable that a certain number of those continually surrounded by perils, in any of the walks of life, should lapse from watchfulness at some fatal moment and be overtaken by the swift catastrophe they have feared. The number of such cases in the mines fluctuates somewhat from year to year, under normal conditions, that is in the absence of exceptional and sweeping disasters like that of Braidwood in 1883, and for the year under consideration the number of killed has been somewhat less than for any year save one. The record of accidents in the mines of Illinois, and the ratio of casualities to the number of men employed and the number of tons of coal mined for a series of five years is as follows:

YEARS.	Number killed....	Number injured..	Total number of men employed...	Total number of tons of coal mined	No. of men to each life lost	No. of tons mined to each life lost ..
1883..................................	134	231	23,939	10,030,991	179.6	74,858
1884..................................	46	197	25,575	10,101,005	556	219,587
1885..................................	39	176	25,446	9,791,874	652.4	251,074
1886..................................	52	169	25,846	9,246,435	497	177,816
1887..................................	41	180	26,804	10,278,890	654	244,735
Totals	312	953	127,610	49,449,195	....	....
Averages....	62.4	190.6	25.522	9,889.839	409	158,491

Including the exceptional loss in 1883, occasioned by the drowning of 69 men in one mine at Braidwood, the average of deaths for five years has been somewhat more than 6·2 per annum, and the average of injuries not fatal nearly 191 per annum, the totals for the period being 312 killed and 953 wounded. Many of the latter have been but slightly hurt, as it is required of inspectors to report all who are so injured as to lose time from their work. As compared with the average for the term the casualities for the last year were not large, though the number varies but little from that of the three years preceding. An analysis of the causes and distribution of the fatal accidents gives the following record.

Fatal Accidents.

CAUSES.	First District.	Second District.	Third District.	Fourth District.	Fifth District.	Total.	Per cent.
Cages, pit-cars, timbers..	3	1	2	1	4	11	26.8
Falling of roof and sides.	10	3	3	2	10	28	68.2
Falling down shaft........	1	1	....	....	....	2	5
Totals....................	14	5	5	3	14	41	100

There were 52 deaths reported for 1886, or 11 more than are shown here. This exemption from loss of life during the past year has been chiefly in the Third and Fourth districts; in the latter there were nine deaths last year and only three in this; and in the former the number is reduced from 11 to five. As usual the greater number of these casualties have occurred in the miners' rooms and have been the result of the falling of rock or coal upon the victims while at work.

This is a pregnant source of danger at all times and in all places; and neither skill, experience nor care can assure to the miner absolute immunity from this form of sudden death. Year after year the record shows that about two-thirds of all accidents are of this character; this year they are 68 per cent. and last year they were 64 per cent. of the whole number. A recent report from Pennsylvania also shows that 62 per cent. of all accidents in the bituminous regions of that State have the same origin. This specific form of danger is a hazard inherent in the occupation of mining coal. Prudence and watchfulness may avert the catastrophe, but they also may not; they may reduce the risk, but they cannot remove it. The miner is always in the presence of danger while at his work, and no law and no system of management can wholly relieve him from it. These agencies can do much, and have done much in this State to remove some of the more patent perils of mining, but they can not hold the mass of rock above the working miner, when every blow of the pick or the machine is imperciptibly loosening it for a swift and fatal fall.

Of the 41 men whose lives were sacrificed this year in the effort to earn a living underground, 24 were men of family, and 17 unmarried. These deaths made 19 widows and rendered 77 children fatherless. The year before, the accidents in mines made 30 women widows and 76 children fatherless. These are people who are too often very poor when they have all a husband and father can earn for them, and are consequently wholly destitute and dependent when that support is taken away. The survivors, moreover, very rarely have any claim against the employing companies, as in the majority of instances the responsibility for the accident rests upon the victim of it. It is considerations such as these which emphasize the demand of the coal miner for a compensation commensurate not only with his labor which is arduous, but with his personal jeopardy, which is great.

Below is presented a classification similar to the foregoing of the non-fatal accidents, showing in what districts they occurred and what occasioned them.

Non-fatal Accidents.

Causes.	Fisrt District.	Second District.	Third District.	Fourth District.	Fifth District.	Total.....	Per cent.
Cages. pit-cars, timbers	4	2	13	9	5	33	18.4
Explosion of gas					2	2	1.1
Explosion of powder			1	6	3	10	5.6
Falling of roof and sides	27	24	26	24	23	124	68.7
Railway cars	5			1		6	3.4
Miscellaneous					5	5	2.8
Totals	36	26	40	40	38	180	100

THE EXAMINATION FOR INSPECTORS.

By an act of the Legislature approved June 18, 1883, provision was made for the appointment, by the Governor, of five State Inspectors of Mines, to have jurisdiction respectively over five specified districts covering all the coal bearing regions of the State, the boundaries and numbers of which were also defined by the same act. In order, however, that competent judgment might be had as to the expert qualifications of the men assigned to these positions a board of examiners was created whose duty it became to hold competitive examinations of candidates and to recommend the most worthy to the executive for appointment. The fifth of such examinations was held on the date fixed for them in September, 1887, and the successful competitors have received their appointments.

The board of examiners for this occasion, chosen under the limitations of the law by the commissioners of this bureau, was composed of the following persons. As representatives of the coal miners, Hon. Daniel McLaughlin, of Braidwood, and Mr. James Kirby, of Barclay; as representatives of coal operators, Mr. H. H. Beach, of Litchfield, and Mr. A. W. Boyden, of Sheffield; as mining engineer, Mr. Hugh Murray, of Ava, Jackson county.

The general topics announced as those upon which candidates would be expected to possess accurate information were: The Mining Laws of the State, the General Character of the Coal Measures of the State, the Development and Working of Coal Mines, the Mechanics of Mine Engineering including the Strength of Materials, Timbering, Hoisting, Haulage, Drainage and Ventilation, the Chemistry of Mine Gases, Surveying, Leveling and the use of instruments employed in Mines.

Upon the date fixed seventeen candidates appeared before the board who were subjected to both a written and oral inquiry upon the lines indicated as to their fitness for the specific duties of inspectors of mines. At the close of a three days session it was found that nine of the whole number had acquitted themselves satisfactorily, and had received 75 per cent. or more of the whole number of possible credits. These were: Walton Rutledge, Alton; Thomas Hudson, Galva; James Freer, Peoria; Quintin Clark, Braidwood; James Taylor, Edwards; W. W. Williams, John Vose, William Lewis and Thomas J. Logan, Streator. To all of these certificates of competency were issued, and the first five were recommended to the Governor for appointment as inspectors of mines.

On the first of October they were duly commissioned for the term of two years and assigned to the following districts:

Quintin Clark, Braidwood, Inspector of the First District.
Thomas Hudson, Galva, Inspector of the Second District.
James Freer, Peoria, Inspector of the Third District.
Walton Rutledge, Alton, Inspector of the Fourth District.
James Taylor, Ashley, Inspector of the Fifth District.

The localities given are the present official addresses of each.

For the information and instruction both of those who were before the board, and of those who may contemplate preparing themselves for future examinations, the examiners have consented to permit the publication of the list of questions to which the class was required to make written answers without the aid of reference books or memoranda of any kind, together with the proper answers to each.

The same questions are of course never propounded in any two examinations, but these will very fairly indicate the scope and character of the tests which may be expected by future aspirants for these positions.

QUESTIONS AND ANSWERS.

SECTION 1.

1. What is meant by the term Coal Measures?

All the beds of rock with which coal is interstratified.

2. Of what are the coal measures composed?

Sandstones, sandy and argillaceous shales. bituminous shales, limestones, and fire clay.

3, What do you know of the Barren Measures?

The conglomerate sandstones at the base of the true Coal Measures were at one time known as the "Barren Measures" or Millstone-grit. They contain seams of coal of workable thickness and shade into true Coal Measures in such a manner that it is difficult to fix any dividing line between them. In the southern part of the State these "Barren Measures" are from two to three hundred feet in thickness and at some points contain well defined coal seams which are, however, generally of a local character. See Economical Geology of Illinois, Vol. 1, page 39.

4. What thickness do the Illinois Coal Measures attain?

From 1,200 to 1,400 feet in some portions of the State.

5. What seams are in the upper and what in the lower Coal Measures, and what stratum is taken as marking the division line of the two Measures?

The seams from No. 1 to No. 9 of the general section are in what are known as the "Lower Measures," and those from No. 10 to No. 16 inclusive in the "Upper Measures," the "Carlinville" or "Shoal Creek" limestone which overlies No. 9 being taken as the dividing line.

6. In what measures do we find the most valuable coal seams?

In the Lower Measures.

How many tons of coal will underlie one acre of land, the seam being $4\frac{1}{2}$ feet thick d lying at an angle of 20°, the specific gravity of the coal being 1.24? Sec. 20°=1.064.

A square acre contains 43560 sq. ft., and $43560\times1.064=46347.8=$ number of square feet underlying an acre at an angle of 20°. And $46347.8\times4\frac{1}{2}=208565.1=$ number of cubic feet of coal. Each cubic foot weighs $62.5\times1.24=77.5$ pounds. The whole weight of coal is therefore $=208565.1\times77.5=16{,}163{,}795.2$ pounds, or 8081.89 tons.

8. How are the several coal seams identified at places wide apart?

By the general character of the enclosing strata and by their fossils.

9. The end of a brake lever travels 12 inches while the brake block travels a quarter of an inch, the whole length of the lever being 12 feet, how far is it from the fulcrum to either end?

The end of the lever traveling 48 times the distance traversed by the brake block the distance from the fulcrum to the end of the lever must be 48 times as great as the distance from the fulcrum to the block connection. From the fulcrum to the block connection is therefore $\frac{1}{49}$ of the whole length of the lever $=\frac{144}{49}=2.9387$ inches, and from the fulcrum to the outer end the distance $=2.9387\times48=$ 141.0576 inches.

10. What size of pipes would you put down to deliver 150 gallons of water per minute?

Assuming a maximum velocity of 4 feet per second, we have $4\times60\times$ area of pipe $=\frac{150}{7.5}$. When area of pipe $=\frac{150}{1800}=\frac{5}{60}=.0833$ square feet $=.0833\times144=11.99$ square inches, whence diameter $=\sqrt{\frac{11.99}{.7854}}=3.90$ inches. I would put down pipes 4 inches in diameter.

11. What do you consider a good working speed for the piston of a direct acting pump; the piston of a winding engine; the flow of water in pipes, and the flow of air in the airways of a mine?

First—75 to 100 feet per minute. Second—400 to 600 feet per minute. Third—180 to 240 feet per minute. Fourth—200 to 400 feet per minute for the flow of air through or past the working places. Often greater velocities will be required, and often lesser velocities will suffice.

12. What size and kind of a pump would you use to deliver 250 gallons of water per minute; and what size of engine would be required to work the pump, the shaft being 300 eet deep, the effective steam pressure 45 pounds per square inch?

If the conditions were suitable I should prefer a double action pump having a direct connection with the engine. Assuming a velocity of 75 feet per minute, then $75\times$ area of pump $=\frac{250}{7.5}$, whence area of pump $=\frac{250}{75\times7.5}=\cdot3333$ square feet. If the pump gives an efficiency of 90 per cent. the area would require to be $\frac{\text{[illegible]}}{90}$ $=.37$ square feet $=53.28$ square inches. Whence the diameter $=\sqrt{\frac{53.28}{.7854}}$ $=8.2$ inches nearly. An 8-inch, or preferably a 9-inch pump would suffice. The pressure per square inch on the pump due to the depth of the shaft $=.434\times300=130$ pounds, or 2.88 times the steam pressure. The area of the steam cylinder must therefore be 2.88 times the area of the pump, so that the steam pressure may balance the pressure of the water. Whence the diameter of cylinder $=\sqrt{2.88\times9^2}=15.2$ inches. The steam cylinder should be 16 inches in diameter.

13. What kind and size of winding engine would you use to hoist at the rate of 1,500 tons of coal per day, of 10 hours, from a shaft 600 feet deep, the load of coal per trip being 1½ tons; effective steam pressure 40 pounds per square inch; piston speed 300 feet per minute?

I would use a coupled engine connecting directly with the drum shaft. The rate of winding is 100 trips per hour. Allowing time for the changing of the cars, we should require to run a trip in 20 seconds, so that the average speed of the rope would be 1,800 feet per minute. A steel rope $1\frac{1}{4}$ inches in diameter and 600 feet long would weigh 1,500 pounds, so that the load to be raised from the bottom would be $=3000+1500=4500$ pounds. The average rate of work to be done by the engines would therefore be $=4500\times1800=$ 8,100,000 foot-pounds per minute. Allowing $\frac{1}{3}$ for surplus power, the units of work would be $8,100,000+2,700,000=10,800,000$. Each cylinder would therefor require to have a capacity of 5,400,000 units of work per minute. The piston speed being 300 feet per minute, and the steam pressure 40 pounds per square inch, the area of the cylinder would be $=\frac{5,400,000}{300\times40}=450$ square inches, and the diameter would be $=\sqrt{\frac{450}{.7854}}=$ 24 inches nearly. If we make the stroke $=32$ inches, then the number of strokes per trip $=\frac{100}{5\frac{1}{3}}=18.75$, and the rope run on the drum per revolution $=\frac{600}{18.75}=32$ feet; whence diameter of drum $=10$ feet nearly. A pair of engines 24 inches in diameter with a 10 foot drum would be able to do the proposed work.

14. What weight of coal in pounds can an average horse lift out of a shaft 100 feet deep, the diameter of gin drum being 4 feet, that of track in which the horse travels 24 feet, the horse having a traction of 120 pounds? What would be the time of winding, the horse to travel at the rate of 2½ miles per hour?

The horse has a leverage of 6 to 1, and will therefore be able to raise a load of $120 \times 6 = 720$ pounds. A speed of $2\frac{1}{2}$ miles an hour $= \frac{2\frac{1}{2} \times 5280}{60} = 220$ feet per minute. The speed of the gin and therefore of the rope is $\frac{1}{6}$ the speed of the horse and is $= \frac{220}{6} = 36.66$ feet per minute. The time of hoisting is therefore $= \frac{100}{36.66} = 2.72$ minutes.

Section II.

15. What are the benefits derived from the splitting of the air currents in mines?

By splitting the air current we get an increased quantity with the same expenditure of power, the increase being determined by the number of splits and by the equality or inequality of their areas and surfaces. Each division has its own current coming fresh from the downcast and returning to the upcast. In the event of an explosion or of a heavy fall in one of the intakes or returns, the derangement in the ventilation affects that one division only, and work may proceed in the rest of the mine while measures are being taken to reëstablish the current there. Where the current is systematically split fewer trap doors are required.

16. With an upcast of 480 feet, the temperature of the downcast being 50°, that of the upcast 170°, what is the pressure produced per square foot: and what depth, with the same difference of temperatures would give a pressure of 2.31 pounds per square foot.

Here $M = D \frac{T - t}{4.59 + T} = 480 \frac{120}{629} = 91$ feet nearly. Assuming an atmospheric pressure of 30 inches of mercury, then the pressure per square foot $= 91 \frac{1.3253 \times 30}{459 + 50} = 7.09$ pounds. And the head being proportional to the depth of the shaft we have finally $7.09 : 2.31 :: 480 :$ required depth; whence required depth $= \frac{2.31 \times 480}{7.09} = 156.4$ feet nearly.

17. If we have two airways of the same length, one being 12 feet by 6 feet, the other 9 feet by 9 feet, what pressure applied to the former will give the same quantity of air that a pressure of 10 pounds per square foot will give in ther latter?

According to the conditions of the question $q = q'$; that is $a.\ v. = a'\ v'$; or $a \sqrt{\frac{p\ a}{k\ s}} = a' \sqrt{\frac{p'\ a'}{k\ s'}}$ and as $s = s'$ we have $a \sqrt{p\ a} = a' \sqrt{p'\ a'}$ or, squaring both sides of the equation $p\ a^3 = p'\ a'^3$

whence $p' = \frac{p\ a^3}{a'^3}$ substituting the given values we have $p' = \frac{10 \times 81^3}{72^3}$ = 14.22 pounds per square foot. The pressure required is 14.22 pounds per square foot.

18. What size of fan or furnace, giving an efficiency of 50 per cent., would you apply to the ventilation of a mine 500 feet deep, the quantity of air required being 40,000 cubic feet per minute, the equivalent orifice of the mine being 20 square feet.

The equivalent orifice of the mine being 20 square feet, if we take .58 as the coefficient of contraction the effective area becomes $20 \times .58 = 11.6$ square feet; and the velocity of flow per second $= \frac{40000}{11.6 \times 60}$ = 57.47 feet. The head due to this velocity $= \frac{57.47^2}{64.4} = 51.28$ feet. As the fan is supposed to give only 50% of its theoretical efficiency on the mine it must be calculated to produce a head $= 51.28 \times 2 =$ 102·56 feet. The theoretically perfect fan with expanding chimney gives a head $= \frac{v^2}{g}$ where v = the peripheral velocity, whence $v = \sqrt{g\ h} = \sqrt{32.2 \times 102.56} = 57{\cdot}46$ feet per second. We would require a fan then whose peripheral velocity would be 57.46 feet per second. If we suppose the fan to run at a rate of 100 revolutions per minute its circumference must be $= \frac{57.46 \times 60}{100} = 34.76$ feet. Whence its diameter $= \frac{34.76}{3.1416} = 11$ feet nearly. A 12 foot fan making 100 revolutions per minute and giving an efficiency of 50% would do more than produce the required current.

To find the size of furnace required to ventilate the given mine, we have, as already found, to produce a head or motive column of 51.28 feet. If we assume a mean temperature in the downcast of 62° we have, first to determine at what temperature a column of air 500 feet high will balance a column of 500—51.28 = 448.72 feet at a temperature of 62°. Volumes being proportional to the absolute temperatures we find the temperature by the following proportion, viz: 448.72 : 500 : : 459+62 : 459+T whence $T = \frac{500 \times 521}{448.72} - 459 = 121°$. The mean temperature of the upcast air must therefore be 121°. Taking 13 cubic feet as weighing one pound, the weight of air passing over the furnace per minute $= \frac{40000}{13} = 3077$ pounds. To raise the temperature of 3077 pounds of air 1° would require the same amount of heat as would raise the temperature of $\frac{3077}{4.38} = 702.5$ pounds of water 1°. To raise the temperature of 702.5 pounds of water through $121° - 62° = 59°$ would require the expenditure of $702.5 \times 59 = 41447.5$ thermal units. And as the combustion of 1 pound of good bituminous coal developes about 14,000 thermal units, to produce the required effect we should require to burn $\frac{41447.5}{14000} = 3$ pounds of coal nearly per minute or 180 pounds per hour. But the efficiency of the furnace is only 50%, half of the heat developed being lost, and so we should require a furnace to burn $180 \times 2 = 360$ pounds of coal per hour. With proper care expended on it a furnace will burn 6 pounds of coal per square foot of grate surface per hour and consuming it at this rate we should require to have $\frac{360}{6} = 60$ square feet of grate surface. Two furnaces having grates 5 feet by 6 feet would produce the required current.

19. What is the breaking strain, and what the safe working load, of a chain, the links of which are half a square inch in section?

The links of chains have about $\frac{7}{10}$ of the strength of two bars of iron, of equal cross section. Taking 20 tons per square inch as the breaking strain of iron the breaking strain of the given chain would be 14 tons, and using as a factor of safety 6, the safe working load would be $\frac{14}{6} = 2.66$ tons.

20. Whai is the breaking load of a pitch pine beam 6 inches broad and 10 inches deep, the distance between supports being 12 feet, when supported at both ends and loaded uniformly?

Breaking load $= 2\frac{b \times a^2}{l} \times \text{constant} = 2\,\frac{6 \times 10^2}{12} \times 550 = 55{,}000$ pounds.

21. What weight will a timber of white oak 8 inches in diameter, and 14 feet between the supports, safely bear when firmly fixed at both ends and loaded at the centre?

Safe load $= 2\,\frac{d^3 \times .6}{l \times 4} \times \text{constant} = 2\,\frac{8^3 \times .6}{14 \times 4} \times 600 = 6{,}583$ pounds.

22. What size of steel wire rope would you use as a winding rope where the load and resistance of the shaft are together equal to 5 tons?

Safe load $= \frac{2.5\ c^2}{7}$ where c = circumference of rope, and the load being 5 tons we have $5 = \frac{2.5\ c^2}{7}$ whence $= c = \sqrt{\frac{3\ 5}{.5}} = 3.74$ inches. Therefore the diameter of the rope $= \frac{3.74}{3.1416} = 1{\cdot}18$ inches. I would use a rope $1\frac{1}{4}$ inches diameter.

23. What gases are usually met with in coal mines?

Carbonic acid; carbonic oxide; light carburetted hydrogen and on rare occasions sulphuretted hydrogen.

24. What is fire-damp?

A compound gas consisting of one atom of carbon combined with four atoms of hydrogen and having a specific gravity of ·555.

25. Describe C. O. giving its physical and chemical characteristics, and the manner of its production in mines.

C. O. is an odorless, colorless gas, combustible but not a supporter of combustion. It is a strong narcotic poison and air containing $\frac{1}{2}$ per cent. of it if breathed for a prolonged period would prove fatal. Its specific gravity is ·968 and it is produced in mines in explosions of fire-damp, from the explosion of gunpowder in blasting, in ventilating furnaces, and from the combustion of coal where mine fires occur.

26. If it was found after an explosion of fire-damp that there was much C. O. in the after-damp, what conclusion would you reach regarding the nature of the explosive mixture?

I would conclude that the proportion of air in the explosive mixture had been less than $9\frac{1}{2}$ to 1 of fire-damp.

Section III.

27. Under what conditions would you consider an explosion liable to take place, where the safety-lamp gave no indication of fire-damp?

In dry and dusty mines, where the coal is of a highly inflammable character, and where blasting with powder is permitted.

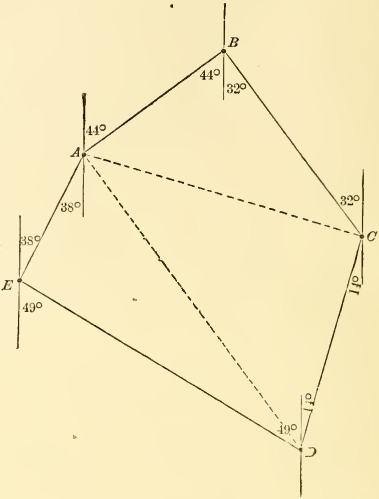
28. What measures would you take to prevent the recurrence of such an explosion?

Stop blasting with powder, or use what is known as the "water cartridge," and bring down the coal by some mechanical means, or blast it with one of the high explosives. Have the dust removed from the working places, and before firing a shot have them copiously watered, using at the same time a fuse that does not sputter fire into the air.

29. What are the requisites of a good safety-lamp?

That it be small and as light as possible; fastened, so that it cannot be tampered with, and cannot be opened without detection, or without going out; that it show a small percentage of gas in the atmosphere; resist a high velocity of air current without passing the flame; be easily extinguished, and self-extinguishing in the presence of fire-damp.

30. The following are the recorded bearings of the five sides of a closed survey: N. 44° E., S. 32° E., S. 14° W., N. 49° W., N. 38° E. Have these bearings been correctly taken?



Let the figure A, B, C, D, E, represent the closed survey. The number of degrees in the angle A, B, C, $=44°+32°=76°$. The number in the angle B, C, D, $=180°-(32°+14°)=134°$. The angle C, D, E, $=14°+49°=63°$. The angle D, E, A, $=180°-(49°+14°) =93°$. The angle E, A, B, $=180°-44°+38°=174°$. And $76°+134°+63°+93°+174°=540°$. The dotted lines A, C and A, D, divide the figure into three triangles. In the same manner any five-sided figure is divisible into three triangles; and as the three interior angles of every triangle are together equal to two right angles, or 180°, the five interior angles of every five-sided figure must be equal to three times two right angles, or $3\times180°=540°$. The bearings in the above survey are therefore proved to be correctly taken, because the number of degrees in the five angles is 540.

31. Where the rooms are run off the entry at an angle of 45°, what length must be measured along the entry to give rooms 20 feet wide, with 12-foot pillars between them?

The width of the room and the thickness of the pillar are together equal to 32 feet. To find the length to be measured on the entry we have to find the hypothenuse of a right angled triangle, having given an angle of 45° and the length of one side = 32 feet. It is evident that the other side is also 32 feet in length. The length of the hypothenuse is therefore $=\sqrt{32^2+32^2}=\sqrt{2\times32^2}=\sqrt{2}\times32=1.41\times32=45.248$ feet. The distance along the entry is therefore $45\frac{1}{4}$ feet nearly.

32. What is the head of water over a rise of 1 in 12 for 76 feet, with an outward fall of 1 in 19 for 650 feet? Would a syphon work if placed under such conditions?

A rise of 1 in 12 for 76 feet gives a total rise of $\frac{76}{12}=6.33$ feet. The fall is $\frac{650}{19}=34.21$ feet. The head of water is therefore $34.21-6.33=27.88$ feet. A syphon ought to work under such favorable conditions.

33. Two bore-holes are put down at the points A and B. The one at A reaches the coal at a depth of 97 feet, the one at B at a depth of 189 feet 9 inches. In a straight line joining the two points, the surface falls from A for 450 feet (horizontal measurement), at the rate of 1 in 15, and then rises to B at the rate of 1 in 28 for 896 feet. What is the inclination of the coal seem?

The fall from A towards B $= \frac{450}{15} = 30$ feet. The rise to B $= \frac{896}{28} = 32$ feet. The point B is therefore 2 feet above the level of the point A, and the depth from B to the level of the coal at the point A is $97+2 = 99$ feet. The depth of the coal at the point B being $189\frac{3}{4}$ feet, the fall of the coal from A towards B $= 189.75—99 = 90.75$. This fall has taken place in a distance of $450+896 = 1,346$ feet and therefore the rate of inclination $= \frac{90.75}{1346} = \frac{1}{14.83}$ or 1 in 14.83.

Statistical Summary, showing the Number, Character, Product, etc., of the Coal Mines of Illinois, for the year ending July 1, 1887—By Districts.

Districts.	No. of new mines	No. mines permanently abandoned	Number of mines	Mines shipping coal	Mines in local trade	Kinds of power.			Kinds of openings.			Modes of working.				Number of miners and other employés.			Average number of days worked	Mules employed in the mines	Kegs of powder used in mining	Number of men killed	No. of men injured so as to lose time	Average price paid per ton for mining	Number of tons of coal produced	Average value of coal per ton at the mines	Mines with escapement shafts	Mines without escapement shafts	Kind of power used for ventilation.			
						Steam	Horse	Hand	Shaft	Slope	Drift	Pillar and room	Long wall	Single entry	Double entry	Miners in summer	Miners in winter	Other employés											Fan	Furnace	Steam jet	Natural
First	8	12	68	44	24	41	27	...	62	1	5	43	25	12	56	5,083	6,269	1,646	169	450	10,221	14	36	89.13	2,686,829	$1 31.6	66	2	38	17	3	10
Second	1	4	275	30	245	40	103	132	115	39	121	267	8	245	30	1,955	3,396	672	150	126	9,524	5	26	92.69	1,069,027	1 49.6	257	18	17	40	11	207
Third	38	25	236	77	159	58	101	77	90	41	105	230	6	100	136	2,388	3,991	912	204	226	51,713	5	40	68.8	1,781,395	1 05.5	202	34	34	125	4	73
Fourth	8	7	111	58	53	59	36	16	91	5	15	104	7	50	54	2,647	3,877	1,057	222	360	47,075	3	40	57.59	2,568,291	88.73	101	10	55	50	2	4
Fifth	5	6	118	83	35	85	28	5	102	8	8	118	..	58	60	2,993	3,625	1,359	195	312	34,094	14	38	53.71	2,173,348	82.48	109	9	36	63	11	8
Totals	60	54	a 808	292	516	283	295	230	460	94	254	762	46	465	336	15,066	21,158	5,646	......	1,474	152,627	41	180	......	10,278,890	....	735	73	180	295	31	302
Averages	..	....	......	...	...	...	...	...	...	..	...	...	..	...	...	......	......	......	183.8	......	....	....	....	72.72	....	$1 08.5	...	....	...	...	..	...

a 7 mines product not given.

FIRST DISTRICT.

Mr. J. S. Lord,
Secretary of the Bureau of Labor Statistics, Springfield, Ill.

Dear Sir:—In compliance with the law I hereby submit my fourth annual report as Inspector of the First inspection district of the State. This report includes tables showing the production of each mine, a tabulated statement of fatal and non-fatal accidents, the number of tons of coal produced for each accident, also the number of employés for each accident with a *resumé* of the trade conditions during the year.

The number of tons of coal produced during the past year, 1887, was 2,668,830, an increase of 342,088 over the preceding year; the average annual production for the past four years is 2,505,485 tons, a gain this year over the average of 163,365 tons. The number of tons of coal produced for each fatal accident during the year was 190,630.7, and for each non-fatal accident 76,252. The number of employès for each fatal accident was 558, and for each non-fatal 223 persons were employed.

The miners in this district have done better and have been more contented during the past year than in the two preceding years; prices have been better, the average price paid for mining being 91.7 cents, while that of the previous year was 80.3 cents in summer, and 88.1 cents in winter.

In Livingston county the Co-operative Coal Company has completed its escapement shaft so that it is fairly within the requirements of the law. The Pontiac Coal Mining Company is developing its mine and is making preparations for sinking an escapement, although the workings are not far enough in to form a communication with it at present, if it were finished.

In Grundy county the Eureka Coal Company has abandoned its shaft and gone out of the coal business, while the No. 3 mine at Braceville has done nothing during the year. The C. W. & V. Coal Company has bought out the Wilmington and Springfield Company and trebled its capacity; they have fitted up larger ventilating machinery, and put a great deal of expense on the roadway.

In LaSalle county the Star Coal Company has abandoned its old mine in Livingston county and is developing its new property at Ripley, four and one-half miles northwest of Streator. It is located on the I., V. & N. Railroad, a line which is now in process of construction from Streator to Walnut, a distance of sixty-five miles.

This will be a great coal carrying route as it is the most direct route to the northwest. It will be a boon to the LaSalle and Streator coal fields, and doubtless will stimulate the opening of other mines along the route. The C. W. & V. Coal Company has sunk and equipped a new mine one and a half miles north of Streator, which is probably the most complete plant in the State. They finished the escapement before starting to operate the mainshaft. It will be run entirely with the Harrison mining machine, and the workmen will be paid entirely by the day. The Star Coal Company has sunk a second shaft at Ripley, but has not opened it up yet. The coal is nine feet thick and of good quality. Their escapement is promised to be finished this fall. The Chicago, Joliet and Streator Coal Company has been under financial embarrassment ever since it was organized, and the property has now passed into the hands of a receiver. It is likely to be brought to sale in October, when the escapement will be immediately started.

In Will county the C. W. & V. has sunk a new mine and in this case will also put down the escapement before beginning to develope the hoisting shaft. The "H" shaft is abandoned and the Allbright Coal Company has also gone out of business.

In Kankakee county, James Kerwin & Co's. mine is abandoned, and the Taylor Williams mine has been proportionately increased in capacity.

There have been no strikes in the district during the year, and the relations of employers and employés have been harmonious with the exception that for a few days in the beginning of May the operators discarded the Columbus scale for the reason as they claimed, that the mines of Southern and Central Illinois had not been brought up to the scale during the previous year. There was, however, no cessation of work and very little acrimony engendered.

Fans.

The following companies or proprietors in this district have erected ventilating fans during the year, where there had formerly been none or verv imperfect ones.

The Oglesby Coal Co.—fan 13 feet in diameter; the LaSalle County Carbon Coal Co.—fan 14 feet in diameter; the Seneca Coal Mining Co.—fan 10 feet in diameter; the C. W. & V. Coal Co.—fan 10 feet in diameter; Walton Brothers, Fairbury,—fan 10 feet in diameter; the Chicago, Joliet and Streator Coal Co.—a Champion fan 4 feet in diameter; R. Evans—fan 5 feet in diameter; and the Star Coal Co.—fan 4 feet in diameter. These latter fans range from 3½ to 4½ feet in width and generally render effective service.

Accidents and their causes are set forth in the statistical table so that it would be superfluous to say more, than that 95 per cent. of all all accidents have happened at the miners' working face where the companies have no responsibilities except to furnish the proper materials to keep the person or persons safe. On the miner devolves the duty of applying them to that purpose. Doubtless more accidents occur through hurry than from any other cause. A great deal of this hurry comes from the system of contract or piece work, but this would be difficult to change and it is not certain that a change would reach the desired end. However this may be, a certain amount of personal care will always be necessary on the part of persons employed in hazardous occupations and without this there is little hope of materially reducing the annual death rate.

There has been no litigation during the year, but a complaint was entered with the State's Attorney of LaSalle county, against the Seneca Coal Mining Company for insufficient ventilation. They immediately proceeded, however, to erect a ventilating fan and the prosecution was allowed to drop. This has been the policy generally pursued and it has been uniformly successful, so much so that there is now only one railroad mine in the district which has not fair ventilation. This is a state of affairs highly gratifying, and one in which I am satisfied to leave the district.

Thanking all those with whom I have been brought in contact for their uniform kindness and courtesy during the four years of my service as inspector, I have to announce that with the expiration of my present term I shall retire from the service.

Very respectfully yours,
ALEXANDER RONALD,
Inspector First District.

Fatal Casualties in the First District.

Date.	Name.	Place.	Age.	Married.	Single.	Children.	Cause of Accident.
1886.							
Aug. 16	Jacobs, Alexander	Streator	61	1	..	..	Falling coal in mine
Oct. 18	Brazapski, John	''	20	..	1	..	'' ''
'' 20	Brizopski, J.	''	20	..	1	..	'' ''
'' 25	Morrison, Robert	Braidwood	36	1	..	6	Falling stone in mine
Nov. 18	Kakara, Andro	Streator	48	1	..	8	Falling coal in mine
Dec. 21	Shephard, William	''	28	..	1	..	Falling rock in mine
1887.							
Jan. 14	McMahan, John	Braceville	65	1	..	2	Falling coal in mine
'' 16	Stanley, Charles	Braidwood	48	1	..	7	Falling rock in mine
'' 17	Baldi, John	LaSalle	23	..	1	..	Unknown, found in cage in morning.
Feb. 28	Anderson, Fred	Braceville	59	1	..	3	Injured by pit-car
April 16	Brawn, Robert	Braidwood	38	1	..	3	Fell down shaft
June 8	Hazlett, Francis	Braceville	60	1	..	2	Riding on car in mine
'' 9	Brawn, John	Braidwood	41	1	..	6	Falling stone in mine
'' 28	Peters, Joseph	Streator	42	1	..	2	Falling rock in mine entry
	Totals		..	10	4	39	

3.9 children to each family.

RECAPITULATION OF FATAL CASUALTIES.

Cause of Accidents.	No.	Per cent.
Falling coal	5	35.71
Falling rock	5	35.72
Falling down shaft	1	7.14
Pit-cars	2	14.29
Unknown	1	7.14
Totals	14	100.00

List of 36 Non-fatal Casualties in the First District.

Date.		Name.	Place.	Age	Married.	Single.	Children.	Cause of Accident.	Time lost.
1886.									
July	22	Hausenkamp, Fred	Streator	26	1	..	1	Falling coal—Collar bone broken	6 W.
"	28	Arrzoul, Richard	Braceville	36	1	..	3	Falling stone—Bruised	
Aug.	15	Jones, William	Streator	41	1	..	..	Crushed leg by Railway cars	
"	25	Dent, Charles	Braceville	48	1	..	3	Shoulder fractured by falling stone	4 Mo.
Sept.	24	Saltz, Anton	Braidwood	44	1	..	3	Arm broke by falling coal	
"	25	Coapenatz James	"	42	1	..	2	Leg broke by falling stone	
"	28	Reese, Thomas	"	38	1	..	4	Injured by falling coal	
"	28	Livsey, John	Streator	40	1	..	6	Foot crushed by falling rock.	
Oct.	2	Rauvana, August	Braceville	45	1	..	4	Leg broken by falling stone	4 Mo.
"	5	Sherlock, John	Streator	49	1	..	..	Leg broken and body bruised by railway cars	
"	6	Marston, Andro	"	45	1	..	2	Crushed by falling rock	
"	9	Ulbrich, Herman	Gardner	34	1	..	2	Ankle dislocated by falling stone	6 W.
"	15	Fisher, Henry	Braceville	30	1	..	2	Bruised by falling coal	1 Mo.
Nov.	11	Foley, Andrew	Braidwood	16	..	1	..	Arm broken by falling stone.	2 Mo.
"	18	Newton, John	Streator	35	1	..	4	Arm broken by falling coal	2 "
"	18	Newton, Walter	"	33	1	..	5	Collar bone broken by falling coal	2 "
Dec.	18	Woodson, Landon	Braidwood	45	1	..	1	Leg bruised by falling coal	
"	21	Robertson, John	Streator	33	1	..	4	Angle broken by falling coal.	2 Mo.
1887.									
Jan.	28	Jones, Evan	"	35	1	..	5	Back injured by falling rock.	6 W.
Feb.	3	Harrison, John	"	41	1	..	4	Injured by falling rock	2 Mo.
"	4	Edmunds, Henderson	Braidwood	46	1	..	1	Chest injured by falling coal.	
Mar.	18	Wilber, George	Streator	18	..	1	..	Injured by falling coal	W.
"	30	Malock, Michael	"	26	1	..	..	Ribs broken by falling rock	6 "
April	12	Gavin, Thomas	"	48	1	..	7	Two fingers crushed by railway cars	7 "
"	25	Nutman, John	"	38	1	..	5	Crushed by descending cage	
May	4	Peterson, John	"	40	1	..	3	Bruised by falling rock	2 W.
"	17	Kennedy, Martin	"	21	..	1	..	Foot crushed by railway car.	
"	17	Murray, Alexander	"	20	..	1	..	Foot crushed by pit-cars	2 Mo.
"	31	Ryan, C. J	LaSalle	42	1	..	2	Hand crushed by railw'y cars	
June	6	Holcomb, Joseph	Streator	16	..	1	..	Collar bone broken by falling coal	M
"	9	Hardin, Thomas	Braidwood	44	1	..	..	Leg broken by falling stone	
"	10	Bryan, John	LaSalle	16	..	1	..	Bruised by pit-car	o.
"	12	Ferryman, Joseph	Streator	36	1	..	6	Back injured by falling rock.	
"	15	Young, Richard	LaSalle	22	..	1	..	Leg injured by pit-cars	
"	27	Roschia, ———	Streator	27	..	1	..	Injured by falling stone	
"	27	Roschia, George	"	25	..	1	..	" " "	
		Totals		..	27	9	79		31½ Mo

2.9 children to each family.

Recapitulation of Non-fatal Casualties.

Cause of Accidents.	No.	Per cent.
Cage	1	2.78
Falling coal	11	30.56
Falling rock	16	44.44
Pit cars	3	8.33
Railway cars	5	13.89
Totals	36	100.00

GRUNDY COUNTY—FIRST DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
C., M. & St. Paul No. 2	Braceville	Shaft	Steam.	110	3.6	2	L.W.	4	Fan	550	550	150	50	273	10	3	4	$0 95	$0 95	274,711	$1 30
S. & W. Star Coal Co	Coal City	"	"	103	3	2	"	2	"	120	180	30	8	160				95	95	75,000	1 40
Wilmington Coal Mining and Manufacturing Co	Diamond City	"	"	103	3	2	"	2	"	300	300	60	14	150	25	1	1	95	95	119,187	1 50
Suffern Bros	Coal City	"	"	110	3	2	"	2	"	65	75	15	5	175	75			95	95	28,969	1 40
Wilm. Star Min. Co. No. 3.	"	"	"	123	3	2	"	2	"	250	300	70	17	170	350			95	95	98,575	1 25
" " No. 4.	"	"	"	115	2	2	"	2	"	48	65	24	2	140	75			95	95	17,070	1 25
a Chicago, Wilmington and Vermilion Coal Co.	Braidwood	"	"	107	3	2	"	2	"	150	150	20	15	105				95	95	45,000	1 25
Taylor Williams	Gardner	"	"	180	3	2	"	2	"	108	140	13	12	245	460			95	95	43,000	1 30
a Chicago, Wilmington and Vermilion Coal Co.	Braidwood	"	"	107	3	2	"	2	"	65	90	10	7	130			1	95	95	27,350	1 30
c Eureka Coal Mining Co.	"	"	"	127	3	2	"	2	"	110	145	48	18	125	160	1		95	95	47,900	1 30
b Chicago Fireproofing Co	Morris	"	Hor :.	45	3	2	P. R.	2	St'm.	25	30	3		200				1 16	1 16	7,200	1 75
Wm. Hornsby	"	"	"	40	3	2	"	2	Fur.		3			100					1 30	300	2 00
George Blair	"	"	"	36	3	2	"	2	Nat.		2			100					1 20	307	2 00
Alexander Telfer	"	"	"	45	3	2	"	2	St'm.	4	6	1		218				1 21	1 21	1,161	1 90
Alexander Bell	"	"	"	40	3	2	"	2	Nat.		2	1		130					1 25	320	2 25
Frank Gilbride	"	"	"	35	3	2	"	2	"		8	1		108					1 30	1,145	2 25
Heather & Wood	"	"	"	40	3	2	"	2	Fur.		15	1		150					1 25	1,600	2 25
John Buck	"	"	"	35	3	2	"	2	"	2	12	2		130					1 20	1,310	2 25

Grundy County—*Continued.*

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and nches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Lee Martin	Morris	Shaft	Horse	36	3	2	P. R.	2	Fur	2	7	1		96					$1 20	964	$2 20
Thomas Walsh	"	"	"	25	3	2	"	2	Nat		5	1		125					1 20	1,095	2 25
Lars Thursan	"	"	"	60	3	2	"	2	"		8	1		85					1 25	760	2 25
Totals										1,799	2,093	452	148		1,155	5	6			792,954	
Averages														148				95.23	95.64		$1 34.7

a Formerly Wilmington and Springfield Coal Co.
b Formerly H. Burrell & Co.
c Mine abandoned and company out of business.

KANKAKEE COUNTY—FIRST DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and nches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Taylor Williams	Clark City	Shaft	Steam	80	3	2	L. W.	2	Fan	180	180	52	17	250				$0 95	$0 95	87,000	$1 35
a James Kerwin & Co.	Tracy	"	"	73	3	2	"	2	"	40	40	10	6	95				95	95	10,000	1 35
Totals										220	220	62	23					$0 95	$0 95	97,000	
Averages														173				.95	.95		$1 35

a Mine closed in February, the property having changed hands and the men being unable to get their pay.

LA SALLE COUNTY—FIRST DISTRICT - 1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	No. of tons of coal produced	Average value of coal per ton at the mine
C. W. & V. Coal Co. No, 1	Streator	Shaft	Steam.	110	5½	7	P. R.	3	Fan	370	400	135	28	216	1,131	1	11	$0 80	$0 80	241,508	$1 20
" " " " 2	"	"	"	85	5½	..	"	2	"	150	150	150	26	175	800	..	....	*a* 37.5	37.5	112,885	1 20
Star Coal Co., Ripley	"	"	"	45	5½	7	"	3	"	.....	200	40	12	140	1,000	..	....	80	80	150,000	1 40
Coal Run C. Co., Eagle	"	"	"	54	5½	..	"	2	"	75	100	20	10	100	151	..	....	80	80	36,000	1 30
" " Otter C'rk	"	"	"	110	5½	..	"	2	"	50	50	15	7	150	22	..	....	80	80	18,000	1 30
Chicago, Joliet & Streator Coal Co., new No. 4	"	"	"	114	5½	..	"	1	"	60	.....	30	3	90	54	..	....	80	......	9,000	1 30
Oglesby Coal Co	Oglesby	"	"	460	3½	2	L. W.	2	"	115	140	42	17	173	8	..	....	90	90	60,500	1 37
Ill. Valley Coal Co., No. 1	"	"	"	450	3½	..	"	2	"	140	200	65	19	206	......	..	....	90	90	81,000	1 28
James Cahill	Peru	"	"	380	3½	..	"	2	"	120	160	38	7	280	3	..	....	*b* 77½	77½	70,000	1 40
Union Coal Co	"	"	"	460	3½	..	"	2	"	170	220	100	20	300	1,000	..	....	90	90	83,079	1 50
Matthiessen & Hegeler, Zinc Co	LaSalle	"	"	350	5½	5	P. R.	2	"	46	46	25	8	310	2,240	..	....	*c* 55	55	74,310	1 40
LaSalle Co. C. C. Co., No. 1	"	"	"	450	3½	2	L. W.	2	"	175	200	65	20	240	......	..	3	90	90	97,921	1 28
Platt Coal Co., No. 1	Seneca	"	"	127	3	2	"	2	"	75	75	25	2	150	6	..	....	95	95	21,130	1 70
LaSalle Co. Carbon Coal Co., Rockwell	LaSalle	"	"	390	3½	2	"	2	"	.....	150	35	6	126	......	1	....	90	90	32,940	1 28
Ben Davis	Streator	Drift	Horse.	25	1	7	P. R.	2	Nat	.....	2	1	....	302	......	..	....	......	80	1,000	1 40
Joseph Crewe	"	"	"	40	5½	..	"	2	Fur	8	12	3	1	250	......	..	....	80	80	5,877	1 40
Robert Fairbairn	"	"	"	25	5	..	"	2	"	1	5	1	....	207	......	..	....	80	80	2,376	1 40
Floyd Bussard	"	Shaft	"	25	4	..	"	2	"	.....	5	1	....	175	......	..	....	80	80	1,334	1 40
Walkins Love	Marseilles	"	Steam.	127	3	2	L. W.	2	"	10	17	5	1	240	......	..	....	95	95	4,700	1 75

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a Machine mine, not included in computing average price of mining.
b Coal not screened, not included in computing average price of mining.
c Output mostly for zinc works, not included in computing average price of mining.

LaSalle County—*Continued.*

Name of firm, company or individul operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd: Summer	Number of miners employ'd: Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining: Summer	Price per ton paid for mining: Winter	No. of tons of coal produced	Average value of coal per ton at the mine
William Howe	Streator	Shaft	Horse	50	5	7	P. R.	2	Fur	5	21	2	....	254	25	..	....	$0 80	$0 80	7,430	$1 50
Samuel McClairry	Grand Ridge	Slope	"	15	10	7	"	2	Nat	2	7	2	....	140	7	..	....	80	80	2,330	1 50
J. White	Streator	Shaft	"	50	5½	7	"	2	Fur	3	9	2	....	153	12	..	....	80	80	3,463	1 50
F. W. Eads	"	"	"	56	5½	7	"	2	"	....	14	2	....	130	9	..	....	80	80	2,370	1 50
Lukins and Kavanaugh	"	Drift	"	56	5½	7	"	3	"	2	21	2	....	60	......	..	....	80	80	2,000	1 50
Burgess Toll	Utica	Shaft	"	35	3	2	"	2	Nat	....	5	1	....	120	......	..	....	......	1 00	1,770	1 50
J. Clark	Lowell	Drift	"	10	3	2	"	2	"	....	4	1	....	125	......	..	....	......	1 00	940	1 75
J. Holdridge	"	Shaft	"	45	3	2	"	2	"	....	5	1	....	130	......	..	....	......	1 00	1,372	1 75
Totals	......	......	......	....	....	..	......	..	......	1,577	2,221	809	187	......	6,471	2	14	......	......	1,125,235	......
Averages	......	......	......	....	....	..	......	..	......	....	....	....	....	180	......	..	....	$ 84.47	$ 84.89	......	$1 32.4

LIVINGSTON COUNTY—FIRST DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geographical No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
C. W. & V. Coal Co. No. 3	Streator	Shaft	Steam	74	5.	7	P. R.	2	Fan	350	375	85	15	152	392	1	4	$0 80	$0 80	$156,315	$1 20
Star Coal Co. No. 2	"	"	"	72	5.	7	"	..	"	150	180	30	8	140	......	1	....	80	80	30,000	1 40
Riverbank Coal Co. No. 2	"	"	"	50	5.	7	"	2	"	80	120	20	6	250	164	..	5	80	80	54,734	1 20
" " No. 3	"	"	"	74	5.	7	"	2	"	50	70	20	6	150	50	..	....	80	80	17,148	1 20
J. D. Kerr	"	"	"	74	5.	7	"	2	"	35	40	5	....	207	150	..	....	80	80	19,000	1 20
Simpkins & Marshall	"	"	"	75	5.	7	"	2	"	26	26	4	....	175	90	..	....	80	80	12,000	1 20
Eli Cope	"	"	"	45	5.	7	"	2	St'm.	4	25	4	....	160	36	..	....	80	80	5,900	1 20
Richard Evans	"	"	"	62	5.	7	"	2	Fan.	50	70	15	5	230	75	2	1	80	80	47,060	1 25
Lukins & Kavanaugh	"	"	Horse.	73	5.	7	"	2	Fur.	2	28	4	....	......	25	1	....	80	80	4,600	1 25
M. J. Barrackman	"	"	"	53	5.	7	"	2	"	8	20	3	....	150	25	..	....	80	80	6,000	1 25
Pontiac Union Coal Co.	Pontiac	"	Steam.	219	5.	5	"	1	Fan.	40	.....	15	2	85	400	..	....	75	75	8,000	1 40
Walton Bros.	Fairbury	"	"	195	5.	5	"	2	"	22	45	17	7	257	888	..	....	......	......	17,758	1 40
Fairbury Coöp. Coal Co.	"	"	"	180	5.	5	"	2	Fur.	10	25	5	....	220	300	..	....	75	75	9,085	1 40
Totals										827	1,024	227	49	......	2,595	5	10	......	......	$387,600	......
Averages														181				.79.7	.79.7		$1 24.1

WILL COUNTY—FIRST DISTRICT—1837.

Name of firm, company or individual operating mine.	own or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
H Shaft C. W. & V. Coal C.	Braidwood	Shaft	Steam.	70	3	2	L. W.	2	Fan	400	400	50	25	173	......	..	4	$0 95	$0 95	150,700	$1 25
J Shaft " " "	"	"	"	97	3	2	"	2	"	150	150	20	10	150	......	2	2	95	95	97,000	1 25
Albright Wilm'ton Coal C.	"	"	"	50	3	2	"	2	"	100	125	22	8	166	......	..	....	95	95	30,000	1 50
Co-operative Coal Co	"	"	Horse.	64	3	2	"	2	Fur.	10	24	2	....	200	......	..	....	95	95	4,677	2 00
Young & Wilson	"	"	"	60	3	2	"	2	"	.....	12	2	....	130	......	..	....	95	95	1,663	2 00
Totals										660	711	96	43	......	......	2	6	......	......	284,040	....
Averages														164	......	..	....	$0 95	$0 95	....	$1 29.3

RECAPITULATION BY COUNTIES—FIRST DISTRICT—1887.

Counties.	No. of mines	No. of mines shipping coal	No. of mines in local trade	Kinds of power employed.			Kinds of openings.			Modes of working coal.				No. of miners and other employés.			Average No. of days worked	No. of mules under ground	No. of kegs of powder used	No. of men killed	No. of men injured so as to lose time	Average price per ton paid for mining.		No. of tons of coal produced	Average price of coal per ton at the mines	No. of mines with escapement shafts	No. of mines without escapement shafts	Kinds of power used for ventilation.			
				Steam	Horse	Hand	Shaft	Slope	Drift	Pillar and room	Long wall	Single entry	Double entry	Miners, summer	Miners, winter	Other employés						Summer	Winter					Fan	Furnace	Steam jet	Natural
Grundy	21	10	11	10	11	....	21	..	....	11	10	9	12	1,799	2,093	452	148	148	1,155	5	6	95.23	95.64	792,954	$1 31.7	21	....	10	4	2	5
Kankakee	2	2	..	2	....	....	2	..	....	....	2	....	2	220	220	62	173	23	......		....	95	95	97,000	1 35	2	....	2	..	..	....
LaSalle	27	17	10	15	12	....	21	1	5	19	8	1	26	1,577	2,221	809	180	187	6,471	2	11	84.47	84.89	1,125,235	1 32.4	26	1	14	8	..	5
Livingston	13	12	1	11	2	....	13	..	....	13	:	2	11	827	1,024	227	181	49	2,595	5	10	79.7	79.7	387,600	1 24	12	1	9	3	1	....
Will	5	3	2	3	2	....	5	..	....	....	5	....	5	660	711	96	164	43	......	2	6	95	95	284,040	1 29.3	5	....	3	2	..	....
Totals	68	44	24	41	27	....	62	1	5	43	25	12	56	5,083	6,269	1,646	.....	450	10,221	14	36	....	....	*a* 2,686,829	....	66	2	38	17	3	10
Averages	....	..	..	..	....	....	....	..	....	....	..	....	..	.....	.....	.....	169	....	......			88.93	89.22	....	$1 31.6	....	....	..	..	..	....

a 274,953 tons not included in averaging prices for mining.

Number of new mines opened 8
Number of mines permanently abandoned 12

ALEXANDER RONALD, *State Inspector.*

SECOND DISTRICT.

Mr. John S. Lord,

Secretary of the State Bureau of Labor Statistics, Springfield, Ill.

Sir: In accordance with section twelve of an Act of the General Assembly providing for the health and safety of persons employed in coal mines, in force July 1, 1883, I herewith submit my fourth annual report as Inspector of Coal Mines for the Second District, for the year ending June 30, 1887.

The present report contains the usual tabular statements, giving the number of mines in the district, their location and depth, the geological number and thickness of the various seams, and the different systems of operating and ventilating the same; the number of miners and other employés engaged in the mining industry of the district; the number of days worked at each mine during the year, with average for each county; the number of tons of coal produced at each mine, and the price per ton paid for mining it, with the value or selling price per ton at the mine.

A record of all fatal and non-fatal accidents is given, with particulars relating to the former; also a statement as to the strikes, or labor troubles that have occurred in the district during the year, with the causes that have produced them, and their final settlement.

The following summaries are presented for the district for the year:

Number of employés—miners		3,396
Number of other employés in and about the mines		672
Total number of employés		4,068
Number of tons of coal produced	1,069,027	
Number of accidents—fatal		5
Number of accidents—non-fatal		26
Total number of accidents		31
Number of employés to each fatal accident		813
Number of employés to each non-fatal accident		156
Number of tons of coal produced for each fatal accident		213,805
Number of tons of coal produced for each non-fatal accident		41,116

The following is a comparative statement of the number of tons of coal produced in the different counties, with the increase or decrease in each, for the years ending June 30, 1886 and 1887:

Counties.	Years.		Increase.	Decrease.
	1886.	1887.		
Bureau	140,562	429,580	289,018	
Hancock	8,550	6,208		2,342
Henry	137,817	117,533		20,284
Knox	38,154	64,324	26,170	
Marshall	56,174	73,928	17,754	
McDonough	91,467	110,103	18,636	
Mercer	103,329	127,708	24,379	
Rock Island	87,713	85,282		2,431
Schuyler	10,123	22,686	12,563	
Stark	17,198	17,865	667	
Warren	13,636	13,810	174	
Totals	704,723	1,069,027	389,361	25,057

The counties of Hancock, Henry and Rock Island show a loss of 25,057 tons, and the counties of Bureau, Knox, Marshall, McDonough, Mercer, Schuyler, Stark and Warren, show a gain of 389,361 tons, from which deducting 25,057, the net increase for the year is 364,304.

The number of visits made to the various mines has been governed largely by what were thought to be the necessities of the case, and the general condition and importance of the mines. The larger ones have been visited from two to four times, and most of the small local mines once during the year.

Three county inspectors have been appointed by county boards, namely: Mr. Fryar Jobling, Tiskilwa, Bureau county; Mr. James Lord, Galva, Henry county, and Mr. S. T. Moore, Colchester, McDonough county, and valuable assistance has been rendered by them.

The following is a table of the casualties in the mines of the district for a series of years.

Comparative Statement of Accidents—Fatal and Non-fatal. Number of tons of Coal Produced, and Number of Employés for four years ending June 30, 1887.

Year.	Killed	Injured	Total	Number of employes	Number of employés to each fatal accident	Number of employés to each non-fatal accident	Totol number of tons of coal produced	Number of tons of coal produced to each fatal accident	Number of tons of coal produced to each non-fatal accident	Ratio of tons of coal produced to each accident—fatal and non-fatal	Number of tons of coal produced to each employe
1884	6	19	25	3,616	602	190	728,146	121,357	38,323	29,125.84	201.36
1885	2	31	33	3,391	1,695	109	724,077	362,038	23,357	21,941.72	213.23
1886	6	22	28	3,599	600	164	704,723	117,454	32,032	25,168.68	195.81
1887	5	26	31	4,068	813	156	1,069,027	213,805	41,116	34,485.38	262.79
Totals	19	98	117	14,674	3,710	619	3,225,973	814,654	134,828	110,721.62	873.19
Averages	4.75	24.5	29.2	3,668.5	927.5	155	806,493.25	203,663.5	33,707	27,680.40	218.30

Fatal Accidents.

✓ September 7, 1886, Oliver Foster, a boy 14 years old, was instantly killed by a fall of roof, in Newman Foster's local mine located near Colchester, McDonough county. Foster was the son of the proprietor of the mine and was working with his father in the face of their room when a portion of the roof fell crushing the boy beneath it, and before he could be extricated life was extinct.

✓ February 12, 1887, Thomas Collins employed as top cager, age 35 years, a single man, was instantly killed by falling down shaft No. 3, located at Spring Valley, Bureau county. This accident occurred about midnight February 12. Collins was employed at the top of the shaft to unload the rock hoisted from the shaft during the night, and was alone at the time of the accident, so that how he fell into the shaft is mere conjecture. The guards or gates around the top of the shafts at Spring Valley were constructed with balance weights, which made it necessary to raise and lower them by hand when the cage was raised or lowered. This system was considered faulty and even dangerous, as the top men would frequently neglect to close them, as in Collins' case, although they had strict orders to do so. This defect in the guards had been pointed out to the manager, and he had been requested to have automatic guards put on, and he had done so at No. 1 and No. 2 shafts, and was making preparations to have them put on at No. 3 shaft at the time of the accident. It is fair to assume that if the automatic gates had been in operation at the time, this accident would not have occurred. Collins fell a distance of about 500 feet.

✓ February 25, 1887, Alexander Frew, a miner, aged 40 years, and single, was fatally injured by a fall of coal in the face of his working place in shaft No. 3 located at Spring Valley, Bureau county, and died from his injuries on the following day.

✓ March 3, 1887, Edward J. Shay, employed as a door-tender, aged 14 years, was instantly killed by being crushed under loaded pit-cars at his trap-door in shaft No. 1, located at Spring Valley.

✓ April 19, 1887. Robert McGregor, a miner, aged 53 years and single, was instantly killed by being caught under a fall of roof in the face of his working place in Locey's mine, located at Loceyville, Bureau county.

Comment is hardly necessary in relation to the above fatal accidents, as it will be readily seen that if these oft recurring casualties are to be materially reduced, greater caution must be exercised. The objective point at which legislation in regard to mining has been aimed, has been and is the diminution of accidents; and such legislation has had a beneficial tendency so far as prescribed methods and regulations in regard to safety appliances are concerned, but, before the best results in this direction can be obtained, the individual must be brought face to face with the fact that he himself is the custodian of his safety, and that only constant vigilance on his part will reduce accidents to the minimum. It has been said, and perhaps truly, that to prevent accidents in the future we must know how they have occurred in the past, but such knowledge will not prevent future accidents unless the lessons taught therein are thoroughly understood and appreciated by the miners themselves.

NON-FATAL ACCIDENTS.

July 20, 1886. Michael Courtney, a miner, aged 18 years, single, had his arm broken by being caught between pit-cars in the Wenona Coal company's mine, Wenona, Marshall county.

July 20, 1886. David R. Cowen, a miner, aged 56 years and married, had his foot injured by a fall of coal in the Quincy Coal Company's shaft No. 20 at Colchester, McDonough county.

August 2, 1886. Chas. Dickerson, a miner, aged 48 and married was injured in the back by a fall of the roof, in Egleston's mine, Colchester, McDonough county.

August 19, 1886. John Cresto a miner aged 40, a married man had his leg broken by a fall of coal in Spring Valley shaft No. 3, Spring Valley, Bureau county.

September 1, 1886. James and Duncan Taylor, (brothers) miners, aged respectively 24 and 22 years, were slightly injured by a fall of the roof, in the Quincy Coal Company's shaft No. 21, at Colchester, McDonough county.

October 29, 1886. Benjamin Higgs, a miner, aged 43 years and married had his leg bruised by a fall of the roof in the Coal Valley Mining Company's shaft, at Cable, Mercer county.

November 12, 1886. Elmer Carlson, miner, aged 20 years a single man had his leg broken by a fall of coal in Spring Valley shaft No. 1, at Spring Valley, Bureau county.

November 16, 1886. G. W. Stiner, a miner aged 30, and married, had his leg broken by a fall of the roof in James Kay's local mine, at Atkinson, Henry county.

November 23, 1886. Valentine Drexel a miner aged 42, a single man, had his leg broken by falling coal in the Elmwood Coal Company's mine near Elmwood, Peoria county. (The mine is located in Knox county.)

December 23, 1886. David Dixon, a miner aged 32, a married man, was injured internally by a prop springing from its position, in the Wenona Coal Company's Mine, Wenona, Marshall county.

December 28, 1886. William Taylor, a coal operator, aged 32, a married man, was injured in the back, by a fall of the roof in Napier and Taylor's mine, Colchester, McDonough county.

January 4, 1887. W. H. Maroe, a miner aged 26 years, and married, had his back injured by a fall of the roof in Sam Jones' local mine at Augusta, Hancock county.

January 5, 1887. H. E. Benson, a miner aged 25 years, had his leg broken by falling coal in shaft No. 3, at Spring Valley, Bureau county.

January 19, 1887. Charles Lentz, a miner aged 37 years and married had his back and foot crushed by a fall of the roof, in the Lathrop Mining Company's shaft No. 6 at Kewanee, Henry county.

January 20, 1887. Shagrach Campbell, a miner aged 62 and married had his collar bone broken by a fall of the roof, in Edgerton's mine at Colchester, McDonough county.

January 27, 1887. D. C. Hammerburg a miner, aged 24 years a single man, had both legs broken by a fall of coal in shaft No. 3, at Spring Valley, Bureau county.

February 5, 1887. Frank Larson, a miner aged 26 years, a single man, had his leg broken by a fall of the roof in Wm. Martin's local mine at Kewanee, Henry county.

February 8, 1887. Samuel Webster, a miner aged 28 and married, had his collar bone broken by a fall of the roof in Edgerton's mine at Colchester, McDonough county.

March 15. 1887. J. Birmingham, a miner aged 23 years, a single man, had his shoulder blade fractured by a fall of coal in Spring Valley shaft No. 2, Spring Valley, Bureau county.

April 24, 1887. Pleasant Fawcett, a miner aged 25 and married, had his collar bone broken by a fall of the roof, in Chas. Saville's local mine, Sparland, Marshall county.

April 26, 1887. Robert Betson, a miner aged 32 and married, had his foot crushed by falling coal in Edgerton's mine, Colchester, McDonough county.

April 27, 1887. John Campbell, a miner aged 27 and married, was injured in the foot by a fall of coal in Edgerton's mine at Colchester.

May 5, 1887. Thomas Docherty, a miner aged 53 years and married was slightly injured in the leg by a loose rock falling from the side of the road-way, in the Coal Valley Mining Company's slope at Cable, Mercer county.

May 16, 1887. George D. Keller, a miner aged 27 years and married, had his back severely crushed by a fall of the roof in Justin Funk's local mine, Colchester, McDonough county.

June 10, 1887. Judson Cox, a miner aged 34 and married, had his arm broken by a fall of the roof in the Co-operative Tile Company's mine, Cable, Mercer county.

The non-fatal accidents recorded above, are similar to casualties of this class generally, and range all the way from slight bruises to broken limbs. The time lost by the former will vary from two to five weeks, and by the latter from two to five and even six months.

Two exceptions to the above may be mentioned, namely: George D. Keller and D. C. Hammerburg, the former may be said to have had his back broken resulting in the total paralysis of the lower limbs. The latter had both legs broken, rendering him completely helpless. He is now in a hospital in Chicago where he is reported to be doing as well as could be expected under the circumstances.

Recapitulation of Fatal Accidents for Four Years, ending June 30, 1887.

CAUSES.	1884.	1885.	1886.	1887.
Falls of roof and coal	5		3	3
Machinery, cages and pit-cars on the surface	1			
Machinery, cages and pit-cars underground			2	1
Explosions of powder, premature blasts, etc			1	
Falling down shafts, slopes, etc		1		1
Inhaling or exploding mine gases		1		
Miscellaneous				
Totals	6	2	6	5

Recapitulation of Non-Fatal Accidents for Four Years, ending June 30, 1887.

CAUSES.	1884.	1885.	1886.	1887.
Falls of roof and coal	14	19	11	23
Machinery, cages and pit-cars on surface			1	
Machinery, cages and pit-cars underground	3	5	3	1
Explosions of powder, premature blasts, etc	2	4	1	
Falling down shafts, slopes, etc			4	
Inhaling or exploding mine gases				
Miscellaneous		3	2	2
Totals	19	31	22	26

STRIKES.

Strikes or labor troubles in the Second district are neither frequent nor of long duration compared with those in other parts of the State or country. Only two occurrences of the kind have taken place during the year, while the number of men engaged and the time lost thereby have been so small as to scarcely call for notice.

The first strike took place at the local mines in Hampton and Moline townships, Rock Island county. The miners had been receiving 3½ cents per bushel for mining, but on October 6, 1886, they requested an advance of ½ cent per bushel which the operators refused to pay and a strike was the result. After standing out one week the operators offered a compromise of ¼ of a cent per bushel and the miners accepted and went to work. About 70 miners were engaged in it.

The next strike took place among the miners employed by the Wenona Coal Co., at Wenona, Marshall county. The cause which led to this trouble, briefly stated was, that the miners wanted the work suspended at noon every Saturday, to give them a half holiday; the manager objected and discharged several of the most persistant advocates of the half-holiday system. A strike was the result, but after three weeks suspension the miners resumed work on the old plan. About 130 men were engaged in it.

IMPROVEMENTS.

The year ending June 30, 1887, has been marked by greater activity in the coal trade than the previous year, but while trade has been more active the general complaint has been that prices were very low and profits correspondingly small. It naturally follows that a general curtailing of expenses has been resorted to, and necessary improvements have been neglected. It is often only by demonstrating their absolute necessity that necessary improve can be obtained at all.

The most important improvements that have been made during the year, have been the sinking or opening of twenty-two escapements. The most of these have been made at small local mines, and are comparatively inexpensive, ranging from drift openings to shafts fifty or sixty feet in depth.

The twenty-two escapements made during the year are distributed through the different counties as follows: One in Henry, six in Knox, four in Marshall, four in McDonough, one in Mercer, and three in Stark; these are all under fifty feet in depth.

There has been completed in Bureau county during the year, an escapement at Seaton Brothers local mine near Hallowayville, 400 feet deep, probably the deepest escapement shaft in the State when the amount of coal produced is taken into consideration, the annual out-put being less than 2,000 tons. The escapement at shaft No. 1, Spring Valley, completed during the year, is about 350 feet deep. A winding engine is on the ground now and cages are being put in the shaft. It is very probable that all timber and other supplies will be sent into, and the miners hoisted out of the mine by this route, leaving the main shaft for coal hoisting exclusively.

The escapements at shafts No. 2 and 3 at Spring Valley. are also being rapidly pushed toward completion, No. 2 being down 276 feet with 80 feet to go, and No. 3 being down 165 feet with 316 feet to go.

All the principal mines in this district are supplied with ventilating fans; every mine where more than 30 men are employed has them with two exceptions, these are the Elmwood Co's mine near Elmwood, and the Sheffield Co's mine at Sheffield. The reason fans are not used at these mines is because steam power is not in use; moreover these mines are peculiarly well adapted for furnace ventilation. Both are slopes, the main entrance or intake entering with a gentle gradient, while the upcast or furnace shafts are located on higher ground and are from 40 to 50 feet deep.

The ventilating fans in use will be ample for the ventilation of the mines at which they are used with the exception of those at Spring Valley. These mines will be classed among the most extensive in the State in the near future, and as the working face advances, the air-ways become longer, and the number of miners increases, a larger volume of air will be required and the fans now in operation will become inadequate. Either larger ones or more of them will be required to keep up the legal sanitary condition of the mines. In these mines the air is divided into two separate divisions or "splits," which method has been found to be defective. Where the air first strikes the working face, the velocity of the current is too great for the comfort of those employed therein, while at the point where the air-current leaves the working face and enters the return air-way the air has become almost unfit for respiration.

To overcome this defect preparations are being made to construct an over-cast in each mine; this will divide the air into four separate currents, giving a supply of pure air to each one-fourth instead of one-half of the miners as heretofore; it will also add an important increase to the total volume of air in circulation.

A new Columbus fan 10 feet in diameter is already on the ground, and will be erected at the escapement of shaft No. 1, and will work in conjunction with the fan already in use. This is an experiment and one not likely to be successful. When two fans are in operation at one mine, they ought to work independently of each other.

The shaft operated by the Coal Valley Mining Company at Cable, was closed temporarily May 1, 1886, and the miners transferred to the slope which had not been operated for two years prior to that time. While the slope was idle, however, important improvements had been made. The engine road which originally only extended to the bottom of the slope, a distance of about 500 feet from the mouth or entrance, has now become an extensive engine plane, one and one-half miles in length, divided into two equal parts, one running east three-quarters of a mile, and one running south about the same distance. A ventilating fan has taken the place of the furnace, and an overcast has been constructed, each division of the mine being now ventilated by a separate current of air. All these passages have been cut through old workings, and consequently it has been necessary to build a great number of stoppings. Considerable difficulty has been encountered in making these stoppings air tight, owing to the persistent tendency of air under extra pressure as it is in fan ventilation, to escape from the intake to the return air-ways.

New Mines Opened and Old Ones Abandoned.

One new mine has gone into operation during the year, namely, the Elmwood Coal Company's mine near Elmwood. Three other shafts have been sunk, and are at the present writing just about ready to commence active operations, namely, shafts No. 26 and 27 by the Quincy Coal Company, at Colchester, McDonough county, and shaft No. 3 by the Lathrop Mining Company, at Kewanee, Henry county.

Four mines have been permanently abandoned during the year, namely, Taylor Williams' mine at Cleveland, and shaft No. 1 of the Lathrop Mining Co., Kewanee, both in Henry county, and shafts No. 21 and 23 of the Quincy Coal Co., Colchester, McDonough county.

Many new local mines are opened and old ones abandoned every year, but to record such in a report of this kind is thought to be unnecessary.

Fires.

The tower and buildings at three mines have been totally destroyed by fire during the year. The buildings at shaft No. 3, operated by the Herdien Coal Co., at Galva, were burned on the night of August 3, 1886.

Those at shaft No. 20, owned by the Quincy Coal Co., at Colchester, McDonough county, were burned on the night of October 28, 1886.

The shaft buildings of the Coal Valley Mining Co., at Cable, Mercer county, were burned about four o'clock on the morning of January 8, 1887.

The fire at Colchester was caused by the ventilating furnace, located near the bottom of the shaft. The origin of the fires at the other mines is shrouded in mystery as the conditions for fire at the time were not favorable.

PROSPECTIVE.

Of the eleven counties which constitute the Second District, the product of three of them, namely: Hancock, Stark and Warren, is used almost exclusively for local consumption, the exception being a little over 2,000 tons which are shipped annually from the Augusta Coal Co.'s mine, located at Augusta, Hancock county. This amount, however, is very liable to cease in the near future; the company has a side track and the usual facilities for shipping, but the thin seam and the soft condition of the roof make mining, on even a small scale, barely possible. The product of the other two counties (Stark and Warren) will show very little variation from year to year.

Knox county shows an increase of 26,170 tons, compared with the year previous. This increase is due to the output of the mine operated by the Elmwood Coal company. This company has heretofore operated a mine in Peoria county, near the east line of Knox, but having exhausted the supply they purchased coal land in Knox county, about a quarter of a mile west of their old mine, and have transferred their mining operations to the latter county.

Of the other seven counties, three of them, Henry, McDonough and Rock Island, are positively on the decline. Henry county shows a decrease for the year just ended of 20,284 tons. This decrease is due principally to a falling off at the three points from which coal is shipped, namely: Cleveland, Kewanee and Galva. The output of the Cleveland mine has been slowly decreasing from year to year; now the coal is exhausted and the mine abandoned.

As the mines at the other places mentioned have not been run to more than one-half their capacity during the year, the decrease might be attributed to unusual depression in the coal market, but it is very probable that another and more positive cause is at work, which is the production of a cheaper and more marketable coal at other points. The coal mined at Kewanee and Galva is from seam No. 6 of the general section, and possesses the usual characteristics of that seam in regard to "clay-slips," "horse-backs," etc. It is not unusual to find entries driven fifty and even a hundred yards on "horse-backs," in which 18 inches of the lower part of the seam only is fit for market, the upper thirty inches being a mixture of lay and coal entirely worthless. The cutting of these irregularities in the seam is alike laborious to the miner and expensive to the operator. Even when the coal is comparitively clean it is not of as good a quality nor as well adapted for shipping as that produced in Bureau and LaSalle counties; hence, competition with the coal raised in those counties is, to say the least, up-hill work.

From present indications coal mining at Galva will not last longer than one or possibly two years. This is true of the shipping trade only. There is coal in abundance for home consumption for many years to come.

Kewanee as a shipping point will last longer, as the coal area is more extensive, but it is not likely that the present annual output will be materially increased; in fact indications point in an opposite direction.

Prospecting with a diamond drill was commenced early in the summer of 1886, by the Lathrop Mining company, at Kewanee; the hole was put down 365 feet, or about 260 feet below the seam now being worked, but the result of the boring is known only to the officers of the company.

In Rock Island county a decrease of 2,431 tons is found for the year just ended, compared with the output of the previous year. This decrease, though small, is significant, inasmuch as the coal trade has been more active during the year just ended than it was during the year previous. The falling off proceeds entirely from the larger mines, those engaged in shipping, and may be divided between Mansill and Battersby's mine, at Coal Valley, known as the "Narrow Guage" shaft, and the mine operated by Taylor Williams, at Rapids City. The former has not been in operation for two years, owing to the low prices prevailing in Moline, at which place the total product of this mine has been consumed, while at the latter mine, which has for the last four years produced about one-half of the total amount of coal raised in the county, the decrease is owing to the coal becoming exhausted. No solid coal remains, and the work of removing or "drawing" pillars, will probably not last longer than one year more, when the mine will be abandoned.

All coal mined in Rock Island county is from seam No. 1 of the general section, which, according to the geological report, lies just above the Devonian and upper Silurian limestone, below which no coal has been found, and none is supposed to exist.

McDonough county shows an increase of 18,636 tons compared with the report of the previous year. This increase, however, may be put down as merely spasmodic, and due to the unusually depressed condition of the coal trade during the year previous.

About ninety per cent. of the coal produced in McDonough county is mined at Colchester, the most of it at the mines operated by the Quincy Coal company. The output of these mines seems to be gradually decreasing, owing to the active competition met with in Quincy, at which point most of the Colchester coal is consumed. The competition comes principally from the coal raised from the thick seams in Sangamon county, and carried thence over the Wabash, St. Louis and Pacific railroad to Quincy. The amount of coal thus brought is increasing gradually from year to year, while the Colchester product is decreasing in a corresponding degree. When it is taken into consideration that the average price paid for mining the Colchester coal is $1.25 per ton, while the average price paid for mining in Sangamon county is 60 cents per ton, the decrease in the output of McDonough county is explained.

The mines at Astoria and Rushville, with their thicker seams and low price for mining, are also potent factors, entering, as they do, into competition with Colchester, in Macomb, Bushnell, Monmouth, and other neighboring towns. Colchester possesses one advantage, however, in the excellent quality of the coal. This will always command for it a market, though it be a limited one, but will not justify the belief that the annual tonnage of McDonough county will ever reach its former proportions.

Of the other four counties in the district, substantial gains are shown at all of them. Schuyler county shows an increase of 12,553 tons compared with the report of the year previous. This increase is due to the mine operated by Work Brothers, at Rushville. This mine is equipped with a steam hoisting apparatus, and has side track connection with the Buda and Rushville branch of the C., B. & Q. R. R., over which the coal is conveyed to market. The seam is 5½ feet thick, overlaid with an excellent slate roof. The capacity of the mine could easily be increased to 200 or 250 tons per day.

Marshall county shows an increase of 17,754 tons over last year, which is due to the further development of the Wenona Coal Co.'s mine, at Wenona. The capacity of this mine at present is about 300 tons per day, and an increase over this may be expected as the workings become more extended.

Mercer county shows an increase of 24,379 tons compared with the previous year. This increase is due to the amount of coal produced at the mine operated by the Empire Coal company, at Gilchrist, which went into active operation early in the spring of 1886. With the exception of Bureau county, Mercer county is the leading coal producing county in the Second district, with every indication of maintaining that position. All coal mined in Mercer county is from seam No. 1 of the general section, similar in quality to the coal produced in Rock Island county, and ranging from 2½ to 5 feet in thickness. Quite a large tract of coal land is known to exist in the neighborhood of the local coal mines operated by Taylor & Boden, near Pre-Emption, the seam being from 3½ to 4½ feet thick. Railroad facilities for transportation will undoubtedly reach this point as soon as the demand for coal will justify the enterprise.

Bureau county shows an increase of 289,018 tons for the year just ended. This increase is due to the development of the Spring Valley Coal Company's mines. According to present indications it is not extravagant to assume that the annual output of Bureau county will reach in the near future, nearly 1,000,000 tons, which increase will come largely from the Spring Valley mines before mentioned. The advantages possessed by this company are,—location, quality of the coal, regularity of the seam and facilities for transportation. The tract of land on which the shafts are sunk is located on or near the northern limit of the Illinois coal fields. The coal is of excellent quality, as is usual in seam No. 2, being sufficiently hard for shipping purposes without slacking and deteriorating in value thereby. The seam is 3½ feet thick, free from "horse-backs," "clay-slips and other irregularities so commonly found in some of the other seams in the district. The workings being comparatively dry, the usual expense of drainage and pumping machinery is avoided. A branch connection is made with the Northwestern Railroad over which most of the coal is carried. The mines are also connected with the Chicago, Rock Island and Pacific Railroad. With such facilities for transportation the product of the mines can be successfully distributed throughout the most remote coal consuming centers of the northwest.

THE MINING LAW.

In section twelve of the mining law it is made the duty of the mine inspectors to recommend such changes in, or amendments to the mining law as they may deem necessary for the better government of the mines. In accordance with the letter and spirit of the above section, I would respectfully recommend an amendment to the present law making it obligatory on the part of all mine managers who have charge of mines where 20 or more men are employed to hold certificates of competency, said certificates to be issued to mine managers after passing a satisfactory examination before a board of examiners appointed for that special purpose, on which the miners and operators shall have equal representation. Any person who shall have been employed as mine manager by the same company or person for one year or more should be entitled to a certificate of service without undergoing an examination, but should not be employed as mine manager by any other company or person without first obtaining a certificate of competency.

Legislation on the above subject is thought to be necessary from the fact that both practical and technical knowledge is necessary for the safe and economical management of our coal mines.

Under our present system it is not unusual to find mines in charge of persons whose knowledge of mining, practical or theoretical is, to say the least, very limited, and there is scarcely any other branch of industry where such a standard of intelligence would be tolerated. The proposed amendment would be conducive to the health and safety of the miners, and give to the operator the benefit of intelligent and economical management.

Another advantage to be derived from such an amendment and one that can hardly be overestimated, is the impetus it would give to the study of mining and kindred sciences. Many of the more industrious and intelligent miners in the State employ their leisure hours in study, fitting themselves for such examinations as are here recommended, and the fact that the coal miner of to-day may become the mine manager of to-morrow will certainly increase the number and thereby give a healthy impulsion to the cause of self-education.

Very respectfully yours,

THOMAS HUDSON,
Inspector of 2d District.
Galva, Ill.

BUREAU COUNTY—SECOND DISTRICT—1887,

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant,								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about the mine	No. of mules employed underground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Spr'g Val. C. Co. shaft No. 1	Spring Valley	Shaft	Steam.	333	3.6	2	L. W.	2	Fan	240	260	50	15	279	74	1	1	$0 90	$0 90	135,859	$1 35
" " " No. 2	"	"	"	357	3.6	2	"	1	"	140	210	40	12	292	16	..	1	90	90	123,262	1 35
" " " No. 3	"	"	"	481	3 6	2	"	1	"	140	220	38	13	293	87	2	3	90	90	92,864	1 35
Geo. H. Locey	Loceyville	"	"	300	3.6	2	"	2	"	62	104	30	8	200	......	1	....	90	90	33,180	1 40
Seaton Bros	Hollowayville	"	"	400	3.6	2	"	2	"	5	10	2	....	160	10	..	....	90	90	1,713	2 00
Fletcher & Sons	Princeton	"	Horse.	325	3.4	2	"	1	Fur.	6	15	2	1	200	2	..	....	1 00	1 00	3,484	2 00
A. W. Walton	"	"	"	150	4.6	6	P. R.	2	"	6	14	3	....	175	70	..	....	1 00	1 00	2,735	1 75
George Heathcock	"	"	"	200	4.6	6	"	2	"	4	8	1	....	150	60	..	....	1 00	1 00	1,110	1 75
W. M. Smith	"	"	Steam.	150	4.6	6	"	2	"	4	12	2	....	185	37	..	....	1 00	1 00	1,898	1 75
John Nichols & Sons	"	"	Horse.	150	4.6	6	"	2	"	4	6	1	....	170	32	..	....	1 00	1 00	690	1 75
Sheffield Mining Co	Sheffield	Slope.	"	45	4.6	6	"	2	"	50	66	11	4	300	75	..	....	87½	87½	20,567	1 75
Joseph Fleming	"	"	"	80	4.6	6	"	2	"	2	9	2	1	180	5	..	....	87½	87½	1,625	1 75
Peter Duncan	"	Shaft.	"	40	4.6	6	"	2	"	4	6	3	....	180	......	..	....	1 00	1 00	1,779	2 00
James Sprague	"	Slope.	"	40	4.6	6	"	2	"	2	9	3	1	260	5	..	....	87½	87½	1,444	2 00
John Higby	"	Shaft.	"	40	4.6	6	"	2	"	5	10	1	....	170	......	..	....	87½	87½	1,500	1 75
H. W. Lloyd	"	Slope.	"	40	4.6	6	"	2	Nat.	1	3	1	1	150	......	..	....	87½	87½	613	1 75
E. Beadle	Buda	Shaft.	Steam.	90	4.6	6	"	2	Fur.	5	12	2	....	200	......	..	....	87½	87½	2,107	1 75
W. H. Forrest	Mineral	"	Horse.	45	4.6	6	"	2	"	2	12	2	....	200	8	..	....	87½	87½	2,000	1 75
John Vanvelzor	"	"	"	46	4.6	6	"	2	"	4	7	1	....	200	15	..	....	87½	87½	600	1 75
C. W. Riley	Neponset	"	"	60	4.6	6	"	2	Nat.	2	6	2	....	130	3	..	....	87½	87½	270	1 75
Thomas Colby	Tiskilwa	"	Hand.	35	3.6	7	"	1	"	2	4	1	....	120	......	..	....	1 00	1 00	130	2 00
Brooks & Ryland	"	Slope.	"	40	3.6	7	"	1	"	2	5	1	....	125	......	..	....	1 00	1 00	150	2 00
Totals	......	......	......	....	....	..	......	..	......	692	1,008	199	56	......	499	4	5	......	......	429,580	......
Averages	......	......	......	....	....	..	......	..	......	....	....	....	....	196	......	..	....	$0 90.1	$0 90.1	......	$1 40

HENRY COUNTY—SECOND DISTRICT—1887.

Name of firm, company, or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés in and about mine	No. of mules employed underground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton, at the mine
										Summer	Winter							Summer	Winter		
b Lathrop Mining Co. No. 6	Kewanee	Shaft	Steam.	100	4	6	P. R.	2	Fan	30	40	16	5	200	......	..	1	$0 40	$0 40 *c*	25,650	$1 50
" " " 6.	"	"	"	100	4	6	"	2	"	18	22	....	....	......	......	..	....	70	80	10,000	1 50
Bernard Kirley	"	"	Horse.	74	4	6	"	2	Fur	8	18	3	....	225	......	..	....	87½	87½	5,200	1 50
William H. Lyle	"	"	"	66	4	6	"	2	"	6	20	3	....	300	......	..	....	87½	87½	4,200	1 50
William Bates	"	"	"	55	4	6	"	2	"	6	13	2	....	225	......	..	....	87½	87½	3,902	1 50
John Atkinson	"	Drift	Hand	....	4	6	"	2	Nat'l.	2	6	1	....	175	......	..	....	87½	87¾	1,621	1 50
William Martin	"	"	"	....	4	6	"	2	"	3	8	....	....	190	......	..	1	87½	87½	1,200	1 50
Thomas Carter	"	Shaft	Horse.	70	4	6	"	2	"	3	8	1	....	175	......	..	....	87½	87½	1,120	1 50
Elijah Plumtree	"	Drift	Hand	....	4	6	"	2	"	.....	7	....	....	100	......	..	....	....	87½	828	1 50
Edwin Lamb	"	"	"	....	4	6	"	2	"	2	3	....	....	200	......	..	....	87½	87½	360	1 50
Fred Greenhagen	"	"	"	....	4	6	"	2	"	1	3	....	....	120	......	..	....	87½	87½	160	1 50
Thomas F. Higgs	"	Shaft	Horse.	65	4	6	"	1	"	1	4	1	....	80	......	..	....	87½	87½	100	1 50
Herdien Coal Co., S. No. 1	Galva	"	Steam.	65	4	6	"	2	Jet	8	20	2	....	240	......	..	....	87½	1 00	4,837	1 75
" " " 3	"	"	"	65	4	6	"	2	"	7	20	2	....	200	......	..	....	87½	1 00	3,400	1 75
" " " 4	"	"	"	70	4	6	"	2	Fan	25	60	4	....	250	......	..	....	75	80	22,000	1 35
" " " 5	"	"	"	61	4	6	"	2	Jet	5	30	3	....	150	......	..	....	75	80	9,550	1 35
Union Coal Co	"	"	"	62	4	6	"	1	"	10	30	2	....	200	......	..	....	87½	87½	4,212	1 75
a Taylor Williams	Cleveland	"	"	100	4	1	"	2	Fan	27	19	9	3	164	185	..	....	75	75	9,968	1 35
George Wictom	Cambridge	"	"	90	3	3	"	2	Jet	3	18	3	....	220	125	..	....	1 12½	1 12½	2,500	2 00
John Mowbray	Atkinson	Slope	Horse.	20	3	3	"	2	Fur	6	10	1	....	250	......	..	....	1 25	1 25	2,172	2 00
Thomas Frew	"	"	"	18	3	3	"	2	"	2	6	1	....	209	......	..	....	1 25	1 25	1,253	2 00
James Kay	"	Shaft	"	40	3	3	"	2	"	.....	6	1	....	120	......	..	1	....	1 25	960	2 00
Robert Wotherspoon	"	Slope	"	20	3	3	"	2	"	.....	5	1	....	125	......	..	....	....	1 25	500	2 00

Henry County—*Continued.*

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room-workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	No. of tons of coal produced	Average value of coal per ton at the mine
John Rochford	Hawley	Shaft	Horse	40	4.6	6	P. R.	2	Fur.	1	6	1	....	180	......	..	....	$0 75	$0 75	1,040	$1 50
J. S. Hadsell	"	Slope	"	25	4.6	6	"	2	Nat'l.	.....	2	...	....	80	......	..	....	....	75	240	1 50
John Parks	Coal Valley	Drift	Hand	....	3.6	1	"	2	"	.....	6	....	....	80	......	..	....	....	1 00	800	1 50
George Hilliard	"	"	"	....	3.6	1	"	2	"	.....	2	....	....	60	......	..	....	....	87½	40	1 50
Martin Peacock	Green River	Shaft	Horse	25	2.6	1	"	2	"	.....	4	....	....	80	2	..	....	....	1 25	320	2 00
Totals	....	......	......	....	....	..	......	..	......	174	396	57	8	......	312	..	3	....	....	117,533	....
Averages	....	......	......	....	....	..	......	..	......	.....	.....	....	....	170	......	..	....	*d* 81.7	87	....	$1 5036

a Coal exhausted and mine abandonéd.
b Mined by Harrison Machine.
c Machine mines not included in these averages.

d Average price of mining per ton based on 92,483 tons.

HANCOCK COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCTS.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room-workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Augusta Coal Co.	Augusta	Shaft	Steam.	70	2.6	2	L. W.	2	Nat'l.	3	8	2	....	200	......	..	....	$1 00	$1 12½	2,428	$1 50
P. P. Newcomb	"	"	Horse.	50	2.6	2	P. R.	2	"	2	7	1	....	160	......	..	....	1 00	1 00	1,200	1 75
A. J. Bruner	"	"	"	30	2.6	2	"	1	"	2	7	1	....	150	......	..	....	1 12½	1 12½	1,040	1 75
Samuel Jones	"	"	"	50	2.6	2	"	2	"	2	6	1	....	170	......	..	1	1 00	1 00	1,020	1 75
Jacob Marks	"	Drift	Hand.	....	2.6	2	"	2	"	1	3	....	....	160	......	..	....	1 00	1 00	400	1 75
John Christian	"	Shaft	Horse.	20	2.6	2	"	2	"	....	2	1	....	100	......	..	....	....	1 00	120	1 75
Totals										10	33	6	....	......	......	..	1	....	....	6,208	....
Averages													....	157	......	..	....	$1 02.1	$1 06.9	....	$1 65.3

KNOX COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd: Summer	Number of miners employ'd: Winter	No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining: Summer	Price per ton paid for mining: Winter	No. of tons of coal produced	Average value of coal per ton at the mine
*a*Elmwood Coal Co	Elmwood	Slope	Horse	40	4.6	6	P. R.	2	Fur	40	50	25	4	300	......	..	1	......	......	29,500	$1 15
Galesburg Brick & Tile Co	Galesburg	Shaft	Steam	70	2	2	"	2	Nat'l.	16	.....	4	....	180	......	..	....	$1 12½	......	3,690	1 75
Ross & Woodward	"	"	Horse	35	4.6	1	"	2	"	3	18	1	....	220	......	..	....	87½	$0 87½	3,255	1 50
Wm. Essex & Son	"	"	"	50	4	1	"	2	"	7	22	1	....	220	25	..	....	87½	87½	3,101	1 50
Patrick Milan	"	"	"	20	3.6	1	"	2	"	.....	4	1	....	120	......	..	....	......	87½	901	1 50
Benjamin Lewis	"	Drift	Hand	....	3	1	"	2	"	2	6	....	....	200	......	..	....	1 00	1 00	600	1 50
Thomas Muir	"	"	"	....	3	1	"	2	"	.....	3	....	....	150	......	..	....	......	1 00	240	1 50
George Clifford	Oneida	Shaft	Horse	40	4	6	"	2	Fur	5	25	2	....	250	......	..	....	75	75	4,730	1 50
James McGovern	"	"	"	50	4	6	"	2	"	1	7	1	....	200	......	..	....	75	75	1,440	1 25
Charles Morgan	"	Slope	"	25	4	6	"	2	Nat'l.	.....	2	....	....	100	......	..	....	......	75	220	1 25
Gus Rodell	Wataga	Shaft	"	50	4	6	"	2	"	3	10	1	....	250	......	..	....	75	75	1,800	1 25
Louis Nordine	"	Slope	"	50	4	6	"	2	Fur	2	8	1	....	200	......	..	....	75	75	1,400	1 25
James Taylor	"	"	"	23	4	6	"	2	"	1	6	1	....	200	......	..	....	75	75	1,317	1 25
Rosenberg & Pierson	"	Drift	Hand	....	4	6	"	2	"	2	4	....	....	180	......	..	....	75	75	800	1 25
Olaf Ostlin	"	"	"	....	4	6	"	2	Nat'l.	1	3	....	....	180	......	..	....	75	75	600	1 25
C. T. Johnson	"	"	"	....	4	6	"	2	"	.....	6	....	....	100	......	..	....	......	75	280	1 25
Benjamin Morgan	"	Slope	Horse	44	4	6	"	2	"	.	5	....	....	100	......	..	....	......	75	250	1 25
J. A. Irvin	Knoxville	Shaft	"	25	2.6	4	"	2	Fur	2	4	1	....	150	......	..	....	1 00	1 00	1,000	1 75
S. H. Hopper	"	Drift	Hand	....	2.6	4	"	2	"	1	6	....	....	140	......	..	....	1 00	1 00	880	1 75
William Jones	"	"	"	....	2.6	4	"	2	"	3	.....	....	....	120	......	..	....	1 00	......	600	1 50
James Nelson	"	"	"	....	2 6	4	"	2	Nat'l.	1	4	....	....	130	......	..	....	1 00	1 00	520	1 75
Nelson & Anderson	"	"	"	....	2.6	4	"	2	"	1	3	....	....	120	......	..	....	1 00	1 00	240	1 50
George Bowman	Yates City	Shaft	Horse	22	4.6	6	"	2	Fur	2	7	1	....	180	......	..	....	75	75	1,200	1 50
Cassius Cox	"	"	"	30	4.6	6	"	2	Nat'l.	.....	4	1	....	100	......	..	....	......	75	720	1 50
Lafayette Dalton	Farmington	"	"	14	4.6	6	"	2	"	2	8	1	....	160	......	..	....	75	75	640	1 25
Ambrose King	Victoria	Drift	Hand	....	4	6	"	2	"	1	4	....	....	150	......	..	....	75	75	520	1 25
David J. Grim	"	"	"	....	4	6	"	2	"	1	3	....	....	150	......	..	....	75	75	360	1 00
George Arnold	"	"	"	....	4	6	"	1	"	.....	3	....	....	100	......	..	....	......	75	240	1 00

William Nelson	Victoria	Drift	Hand	....	4	6	P. R.	2	Nat'l.	....	3	....	....	100	....	..	....	....	$0 75	320	$1 00
Anson Grim	"	"	"	....	4	6	"	2	"	....	3	....	....	100	....	..	....	....	75	280	1 00
Eric Stomberg	"	"	"	....	3.6	6	"	2	"	1	2	....	....	140	....	..	....	$0 75	75	240	1 00
George Williams	"	Slope	Horse	20	4.6	6	"	2	"	....	3	....	....	100	....	..	....	....	75	180	1 00
T. F. Templeton	"	Drift	Hand	....	4	6	"	2	"	....	2	....	....	80	....	..	....	....	75	180	1 00
John Smith	"	"	"	....	4	6	"	2	"	....	3	....	....	100	....	..	....	....	75	120	1 00
Julius Smith	Truro	"	"	....	4	6	"	2	"	....	7	....	....	100	....	..	....	....	75	600	1 00
John Walsh	"	"	"	....	4	6	"	1	"	1	4	....	....	150	....	..	....	75	75	480	1 00
C. A. Anderson	"	"	"	....	4	6	"	2	"	1	5	....	....	150	....	..	....	75	75	380	1 00
G. M. Cox	"	Slope	Horse	10	4	6	"	2	"	1	3	....	....	120	....	..	....	75	75	320	1 00
Jesse Etcheson	Maqnon	Drift	Hand	....	2	4	"	2	"	....	2	....	....	100	....	..	....	....	1 00	180	1 50
Totals	....	....	....	....	....	..	....	..	....	101	262	42	4	....	25	..	1	....	....	64,324	....
Averages	....	....	....	....	....	..	....	..	....	....	....	....	....	151	....	..	....	*b* 91	$0 80.9	....	$1 29.8

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a New mine, miners paid by the yard; for rooms 15 feet wide, $3.00 per yard; for entries 6 feet wide, $1.75 per yard.
b Average price for mining per ton based on 34,824 tons.

MARSHALL COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Wenona Coal Company	Wenona	Shaft	Steam	555	2.8	2	L. W.	2	Fan	125	150	30	5	204			2	$0 90	$0 90	68,768	$1 50
William Bough	Henry	Drift	Hand		3.6	7	P. R.	2	Nat'l,	1	3			170	8			87½	87½	500	1 25
Alex. Daniels	"	"	"		3.6	7	"	2	"	2	2			170				87½	87½	300	1 50
John Kenney	"	"	"		3.6	7	"	2	"	1	2			120	6			87½	87½	240	1 25
Joseph Turner	"	"	"		3.6	7	"	2	"		2			100					87½	240	1 50
W. C. Lopeman	"	"	"		3.6	7	"	2	"	1	2			120				87½	87½	220	1 25
John Daniels	"	"	"		3.6	7	"	2	"	1	2			120	5			87½	87½	200	1 25
Thomas Taylor	"	"	"		3.6	7	"	2	"		2			100					87½	200	1 50
John McFadyen	"	"	"		3.6	7	"	2	"		2			100					87½	200	1 25
William Horrocks	"	"	"		3.6	7	"	2	"	1	1			120				87½	87½	160	1 25
James Thompson	"	Shaft	Horse	50	4.6	7	"	1	"		2	1		100	10				87½	80	1 50
Joseph Caley	"	Drift	Hand		3.6	7	"	2	"		1			80					87½	80	1 50
W. M. Osborne	Sparland	"	"		3.6	7	"	2	"	3	6			175	10			87½	87½	840	1 25
George Murray	"	"	"		3.6	7	"	2	"		3			100	4				87½	440	1 25
R. M. Frisbie	"	"	"		3.6	7	"	2	"	1	3			150	4			87½	87½	400	1 25
Charles Saville	"	"	"		3.6	7	"	2	"	1	3			150	3		1	87½	87½	320	1 25
Scott Osborne	"	"	"		3.6	7	"	2	"		2			100	2				87½	280	1 25
John Flynn	"	"	"		3.6	7	"	1	"	1	2			120	2			87½	87½	240	1 25
George Kear	"	"	"		3.6	7	"	2	"		2			100	2				87½	120	1 25
John Davis	"	"	"		3.6	7	"	2	"		2			100	1				87½	100	1 25
Totals										138	194	31	5		57		3			73,928	
Averages														125				89.8	89.8		$1 48.5

McDONOUGH COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés, in and about the mine	No. of mules employed underground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Quincy C. Co. shaft No. 20	Colchester	Shaft	Steam.	85	2.4	2	P. R.	2	Fur.	37	37	3		200			1	$1 12½	$1 37½	11,203	$1 62½
a “ “ No. 21	“	“	“	100	2.2	2	“	2	“		30	4		127			2		1 37½	8,100	1 62½
a “ “ No. 23	“	“	“	100	2.2	2	“	2	“	35	35	3		160				1 12½	1 37½	14,000	1 62½
“ “ No. 24	“	“	“	85	2.4	2	“	2	Fan.	84	100	4		187				1 12½	1 37½	15,619	1 62½
“ “ No. 25	“	“	“	85	2.4	2	“	2	“	54	65	4		187				1 12½	1 37½	12,256	1 62½
William Edgerton	“	“	“	50	2.6	2	“	2	“	40	50	5		258			5	1 00	1 25	10,000	1 62½
Colchester Coal Co.	“	“	“	72	2.6	2	“	2	Jet	30	30	4		197				1 12½	1 37½	10,185	1 62½
William Hulson	“	“	“	60	2.6	2	“	2	Nat'l.	3	3			200				1 00	1 25	610	1 62½
Napier & Taylor	“	“	Horse.	60	2.6	2	“	2	“	3	3	1		180			1	1 00	1 25	1,000	1 62½
Wilson & Little	“	“	“	60	2.6	2	“	2	“	2	4	1		160				1 00	1 25	800	1 62½
John Hunter	“	“	“	60	2.6	2	“	2	“	2	2	1		180				1 00	1 25	1,000	1 62½
William Robinson	“	Drift	Hand.		2.2	2	“	2	“		2			60					1 25	620	1 75
Thomas Greenbank	“	“	“		2.6	2	“	2	“	2	3			160				1 00	1 25	600	1 62½
Peter Whalen	“	Shaft	Horse.	60	2.2	2	“	2	“		5			60					1 25	600	1 75
Louis Lewis	“	Drift	Hand.		2.2	2	“	2	“	2	4			200				1 00	1 25	1,200	1 62½
Barney Cash	“	“	“		2.2	2	“	2	“	5	7			200				1 00	1 25	1,500	1 62½
Milton Stevens	“	“	“		2.6	2	“	2	“	2	2			225				1 00	1 25	1,000	1 50
Michael Hume	“	“	“		2.6	2	“	2	“	4	4			200				1 00	1 25	1,250	1 50
Wash. Dixon	“	“	“		2.2	2	“	2	“		3			60					1 25	200	1 62½
William Moon	“	“	“		2.2	2	“	2	“		3			60					1 25	200	1 62½
John Zimmerman	“	“	“		2.2	2	“	2	“		2			70					1 25	200	1 62½
R. McClure	“	“	“		2.2	2	“	2	“		3			60					1 25	200	1 62½
William Hodgson	“	“	“		2.2	2	“	2	“	2	3			160				1 00	1 25	800	1 62½
William McIntosh	“	“	“		2.4	2	“	2	“	2	2			100				1 00	1 25	300	1 62½
U. Vawter	“	“	“		2.2	2	“	2	“		6			70					1 25	700	1 62½
John Wilson	“	“	“		2.2	2	“	2	“		4			90					1 25	800	1 62⅓

McDonough County—*Continued.*

Name of firm(company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift. slope or shaft	Steam, horse or hand-power	Depth of coal below the surface.	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced (including nut coal).	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
William Bright	Colchester	Drift	Hand		2.2	2	P. R.	2	Nat'l.		5			80					$1 25	800	$1 62½
George Wakefield	"	"	"		2.2	2	"	2	"		1			60					1 25	100	1 62½
Newman Foster	"	"	"		2.2	2	"	2	"	1	2			125		1		$1 00	1 25	200	1 62½
Michael Whalen	"	"	"		2.2	2	"	2	"		5			90					1 25	300	1 62½
W. D. Williams	"	"	"		2.2	2	"	2	"		4			100					1 25	500	1 62½
Moses King	"	"	"		2.6	2	"	2	"		2			60					1 25	100	1 62½
John Burgess	"	"	"		2.6	2	"	2	"	1	1			200				1 00	1 25	300	1 50
Eli Hilliard	"	"	"		2.6	2	"	2	"		1			30					1 25	40	1 62½
George Mordue	"	"	"		2.6	2	"	2	"	2	2			150				1 00	1 25	300	1 62½
William Eckersly	"	"	"		2.6	2	"	2	"	2	2			220				1 00	1 25	500	1 62½
R. McCord	"	"	"		2.2	2	"	2	"		2			90					1 25	300	1 62½
L. P. Atkinson	"	"	"		2.2	2	"	2	"		5			90					1 25	500	1 62½
William Foster	"	"	"		2.2	2	"	2	"		1			100					1 25	200	1 62½
Heron & Reece	"	"	"		2.2	2	"	2	"	2	6			150				1 00	1 25	600	1 62½
George Usher	"	"	"		2.6	2	"	2	"	3	3			160				1 00	1 25	400	1 62½
William Bungardner	"	"	"		2.4	2	"	2	"		5			80					1 25	500	1 62½
William Kipling	"	"	"		2.2	2	"	2	"		5			90					1 25	500	1 62½
Thomas Kipling	"	"	"		2.2	2	"	2	"		2			60					1 25	150	1 62½
Louderman & Wolf	"	"	"		2.6	2	"	2	"		2			90					1 25	400	1 62½
Justin Funk	"	"	"		2.6	2	"	2	"	3	3			170			1	1 00	1 00	800	1 25
James Roberts, Jr	"	"	"		2.6	2	"	2	"		3			30					1 25	130	1 50
John Pearson	"	Slope	"		2.4	2	"	2	"	2	2			180				1 00	1 25	500	1 62½
Bradbury & Co	Prairie City	Shaft	Steam	52	1.8	2	"	2	Jet	10	10	2		260				1 25	1 25	1,040	2 25
John E. Dunham	"	"	Horse	52	1.8	2	"	2	Nat'l.	2	5	1		120				1 50	1 50	800	2 25
Charles Millett	"	"	"	52	1.8	2	"	2	"	2	4	1		120				1 50	1 50	600	2 25

A, Newland	Tennessee	"	Steam.	40	2.2	2	"	2	Fur.	5	7	2		160				1 00	1 25	1,200	1 62½
Dull Bros.	"	Drift.	Hand.		2.2	2	"	2	Nat'l.	2	5			150				1 00	1 25	500	1 50
Fergus Whelan	"	Shaft.	Horse.	40	2.2	2	"	2	"		2	1		60					1 25	200	1 62½
Frank Verdick	Industry	Drift.	Hand.		2.6	1	"	2	"	2	4			130				1 00	1 25	400	1 75
W. D. Janes	"	"	"		2.6	1	"	2	"	2	3			150				1 00	1 25	400	1 75
George Johnson	"	"	"		2.6	1	"	2	"		2			60					1 25	200	1 75
Joseph Dodds	Blandinsville	Slope.	Horse.	60	2.6	2	"	2	"		2			60					1 50	150	2 25
Harvey & Hanson	"	"	"	60	2.6	2	"	2	"		2			60					1 50	150	2 25
John Gibson	Fandon	Drift.	Hand.		2	1	"	1	"		3			60					1 25	200	1 50
Wash Smith	"	"	"		2	1	"	1	"		3			60					1 25	200	1 50
William Hood	Bushnell	"	"		2.4	2	"	2	"		2			90					1 25	500	1 75
George Bowie	"	"	"		2.4	2	"	2	"		2			90					1 25	500	1 75
Totals										350	532	37				1	10			110,103	
Averages														125				$1 0965	$1 3303		$1 63.7

a Coal exhausted and mine abandoned.

MERCER COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd		No. of other employès, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining		No. of tons of coal produced (including nut coal.)	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Coal Valley Mining Co	Cable	Slope	Steam	60	3.6	1	P.-R.	2	Fan	128	76	74	12	265	1,017	..	1	$0 95	$0 95	51,377	$2 00
" " " "	"	Shaft	"	60	4.6	1	"	2	"	.....	138	86	14	46	659	..	1	....	95	22,092	2 00
Co-operative Tile Works	"	Slope	Horse	20	3	1	"	2	Nat'l	6	25	4	3	150	125	..	1	87½	87½	3,503	1 75
Charles Peterson	"	Shaft	Steam	65	4	1	"	2	"	1	14	1	....	150	50	..	....	1 00	1 00	1,675	1 75
Empire Coal Co	Gilchrist	"	"	100	3.6	1	"	2	Fan	75	75	25	5	226	2,895	..	....	75	85	33,653	1 10
John D. Tarr	Viola	"	Horse	52	4	1	"	2	Nat'l	2	6	1	....	200	92	..	....	75	75	1,840	1 25
F. M. Martin	"	"	"	65	4	1	"	2	"	2	6	1	....	150	75	..	....	87½	87½	1,800	1 50
Russel Parks	"	"	"	32	4	1	"	2	"	2	4	1	....	150	26	..	....	75	75	1,000	1 25
William Blain	"	"	"	32	3	1	"	2	"	1	4	1	....	150	25	..	....	75	75	800	1 25
Samuel Guthrie	"	"	"	41	4	1	"	1	"	.....	2	1	....	100	6	..	....	....	75	240	1 25
Robert Taylor	Preëmption	"	"	56	4	1	"	2	"	2	8	1	....	160	95	..	....	75	75	2,680	1 25
Edward Boden	"	Slope	Steam	22	4.6	1	"	2	"	4	12	1	....	150	28	..	....	75	75	2,280	1 25
Edward Clark	"	Shaft	Horse	61	4	1	"	2	"	.....	4	1	....	75	12	..	....	....	75	380	1 25
Campbell Williams	Millersburg	"	"	36	2.6	1	"	2	"	2	5	1	....	140	......	..	....	1 00	1 00	360	1 50
Walter Wakeland	"	"	"	30	2.6	1	"	2	"	.....	3	1	....	100	......	..	....	....	1 00	280	1 50
Henry Fowler	"	Drift	Hand	....	2.6	1	"	2	"	1	2	....	....	120	......	..	....	1 00	1 00	200	1 50
John Swanson	New Windsor	Shaft	Horse	30	2.6	1	"	2	"	3	14	1	....	200	70	..	....	1 12½	1 12½	1,400	1 75
Jonas Simelson	"	"	"	30	2.6	1	"	2	"	.....	6	1	....	120	20	..	....	....	1 12½	600	1 75
Charles Peterson	"	Drift	Hand	....	2.6	1	"	2	"	1	3	....	....	140	......	..	....	1 00	1 00	400	1 50
Griffin Bros	Griffin	Shaft	Horse	30	2.6	1	"	2	"	2	4	1	....	250	7	..	....	1 00	1 00	908	1 75
Robert Thompson	Aledo	"	"	20	2	2	"	2	"	1	2	1	....	160	......	..	....	1 00	1 00	240	1 75
Totals	....	....	....	....	....	..	......	..	......	233	413	204	34	......	5,202	..	3	....	....	127,708	....
Averages	....	....	....	....	....	..	......	..	......	....	....	....	....	152	......	..	....	$0 86.9	$0 91.4	....	$1 68

ROCK ISLAND COUNTY—SECOND DISTRICT.—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd: Summer	Number of miners employ'd: Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining: Summer	Price per ton paid for mining: Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Taylor Williams	Rapids City	Shaft	Steam	80	4	1	P. R.	2	Fan	50	75	35	9	265	1,000			$0 75	$0 75	36,199	$1 80
Fred Kollman	" "	"	"	80	2.6	1	"	2	Nat'l.	7	4	2	1	180	45			87½	1 00	1,088	1 75
Bailey Davenport	Rock Island	"	"	80	3.6	1	"	2	Jet	6	16	3	1	230	71			1 00	1 00	1,892	2 00
Northern Min. Co. B shaft.	Hampton	"	"	62	3.6	1	"	1	"	35	35	8		250	350			87½	87½	8,600	1 75
Guckert Bros	"	"	Horse	28	3.6	1	"	2	Fur		6	1		100	12				1 00	705	1 75
Eureka Coal Company	Moline	"	"	56	3.6	1	"	2	Jet	5	17	2		240	100			87½	1 00	4,208	1 62½
Joseph Donald	"	Slope	Steam	40	3.6	1	"	2	Nat'l.	6	12	1		200	150			87½	1 00	2,820	1 62½
George Donald	"	"	Horse	40	3.6	1	"	2	"	5	12	2	1	150	150			87½	1 00	2,428	1 62½
William Allison	"	"	"	60	3.6	1	"	2	Fur	4	10	2	3	200	140			1 00	1 00	1,880	1 75
Black Diamond Coal Co	Coal Valley	Shaft	Steam	40	3.6	1	"	2	"	15	25	3		200	75			94	94	7.200	1 62½
John Price	"	"	Horse	70	3	1	"	2	Nat'l.	2	15	1		180	20			87½	87½	4,000	1 62½
John Stephens	"	Drift	Hand		4	1	"	2	"		3			100					1 00	560	1 50
William Johnson	"	"	"		4	1	"	2	"	1	2			150	10			87½	87½	480	1 50
David Edwards	"	"	"		3.6	1	"	2	"		4			120					1 00	430	1 75
William Moss	"	"	"		4	1	"	2	"	1	1			120				75	75	320	1 50
Joseph Garland	"	"	"		4	1	"	2	"	1	1			140				87½	87½	200	1 50
John Moros	"	"	"		4	1	"	2	"	1	1			120	3			75	75	200	1 50
George Wilson	"	"	"		3.6	1	"	2	"		2			100					1 00	180	1 75
Joseph Sackville	"	"	"		2	1	"	2	"		2			100					1 25	120	1 75
Silvis Bros	Carbon Cliff	Shaft	Horse	80	4	1	"	2	Jet	15	25	2		250	185			87½	87½	8,540	1 62½
Daniel Woodbury & Son	" "	Slope	"	15	3.6	1	"	2	Nat'l.	6	16	1	1	180	80			87½	87½	1,700	1 50
William Parker	Milan	Shaft	"	56	3	1	"	2	"	2	6	1		180	12			87½	87½	940	1 62½
Fred Vonach	"	"	"	40	3	1	"	2	"	1	3	1		150				87½	87½	464	1 62½
Patrick McCarty	"	Drift	Hand		2.6	1	"	2	"		2			100					1 25	128	1 75
Totals										163	295	65	16		2,403			$0 83.1	85.36	85,282	
Averages														1.67							$1 72.3

SCHUYLER COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Work Bros. & Co	Rushville	Shaft	Steam	50	5.6	5	P. R.	2	Fan	30	50	10	3	200	675	..	....	$0 67½	$0 67½	16,880	$1 00
John Kerr	"	"	Horse	46	5	5	"	2	Fur	2	8	1	....	180	148	..	....	67½	67½	2,306	1 25
Porter & Lawrence	Ray	Drift	Hand	....	2.6	3	"	2	Nat'l.	5	5	....	....	250	......	..	....	1 00	1 00	2,040	1 75
Pemberton Bros	"	"	"	....	2.6	3	"	2	"	2	....	....	....	120	......	..	....	1 00	....	400	1 75
John Easton	Pleasant View	Slope	Horse	15	4.6	5	"	1	"	.....	3	....	....	80	6	..	....	....	75	480	1 00
Walter Croxton	"	Drift	Hand	....	4.6	5	"	2	"	.....	3	....	....	70	5	..	....	....	75	400	1 00
Worth Prindle	Fredrick	"	"	....	2.6	3	"	2	"	.....	2	....	....	80	3	..	....	....	1 12½	180	1 50
Totals	....	....	....	....	....	..	......	..	......	39	71	11	3	......	837	..	....	....	....	22,686	....
Averages	....	....	....	....	....	..	......	..	......	.....	.....	....	....	140	......	..	....	$0 71.1	$0 71.6	....	$1 15.4

STARK COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft........	Steam, horse or hand-power........	Depth of coal below the surface—feet........	Thickness of coal—feet and inches........	Geological No. of seam....	Long-wall or pillar and room workings........	No. of places of egress....	Ventilation, by fan, furnace or otherwise........	Number of miners employ'd		No. of other employés, in and about mine........	No. of mules employed under ground........	No. of days worked during the year........	No. of kegs of powder used during the year........	No. men killed during year	No of men injured so as to lose time........	Price per ton paid for mining.		No. of tons of coal produced........	Average value of coal per ton at the mine........
										Summer........	Winter........							Summer........	Winter........		
James Higby........	Wyoming........	Shaft..	Horse.	80	4	6	P.-R.	2	Fur.	5	11	1	....	175	10	..	....	$0 75	$0 75	2,880	$1 50
Thomas Stephenson........	"	"	"	57	4	6	"	2	Nat'l.	3	8	1	....	160	4	..	....	75	75	1,468	1 50
R. Robinson & Bros........	"	"	"	50	4	6	"	2	"	2	5	1	....	150	4	..	....	75	75	880	1 50
George Watson........	"	"	"	77	4.6	6	"	2	"	3	8	1	....	160	14	..	....	75	75	1,200	1 25
John McCarty........	"	Slope.	"	15	4	6	"	2	"	1	3	....	....	130	......	..	....	75	75	600	1 25
Joseph Swanson........	"	Shaft..	"	30	4	6	"	2	"	2	3	1	....	150	......	..	....	75	75	400	1 25
Foster Coulson........	"	Drift..	Hand.	....	4	6	"	2	"	.....	5	....	....	100	......	..	....	......	75	400	1 25
John Cummings........	"	"	"	....	4	6	"	2	"	1	2	....	....	160	......	..	....	75	75	360	1 25
Richard Howarth........	"	"	"	....	4	6	"	2	"	1	1	....	....	100	2	..	....	75	75	200	1 25
John Scott........	Modena........	Shaft..	Horse.	48	4.6	6	"	2	"	2	7	1	....	175	......	..	....	87½	87½	1,520	1 50
G. L. Talbot........	"	"	"	50	4.6	6	"	2	"	.....	3	1	....	100	......	..	....	......	87½	480	1 57
Nathan Snare........	"	Drift..	Hand.	....	4	6	"	2	"	1	3	....	....	150	......	..	....	87½	87½	440	1 25
Perkins & Smith........	"	Shaft..	Horse.	60	4.6	6	"	1	"	1	6	1	....	140	......	..	....	87½	87½	418	1 50
Hugh McGurl........	"	Drift..	Hand.	....	4	6	"	2	"	.....	2	....	....	100	......	..	....	......	75	200	1 25
Henry Newton........	"	"	"	....	4	6	"	2	"	1	1	....	....	160	......	..	....	75	75	120	1 25
Oscar Bass........	Toulon........	Shaft..	Horse.	20	5.6	6	"	2	"	2	9	1	....	150	20	..	....	75	75	1,912	1 25
William Newton........	"	Drift..	Hand.	....	4	6	"	2	"	1	2	....	....	150	......	..	....	75	75	328	1 25
Fred Charleson........	Castleton........	"	"	....	4	6	"	2	"	1	3	....	....	150	......	..	....	75	75	480	1 25
Thomas D. Aitken........	Bradford........	Shaft..	Horse.	105	4.6	6	"	2	"	2	4	1	....	140	43	..	....	1 00	1 00	1,008	2 00
Reuben Holgate........	Lombardville..	"	"	135	4.6	6	"	1	"	2	4	1	....	100	16	..	....	1 00	1 00	280	2 00
James Green........	Osceola........	Slope.	"	30	4	6	"	2	"	2	8	1	....	150	......	..	....	87½	87½	1,295	1 50
Joseph Armstrong........	"	Drift..	Hand.	....	4	6	"	2	"	.....	2	....	....	100	......	..	....	......	87½	160	1 25
John Catton........	West Jersey....	"	"	....	5	4	"	2	"	1	4	1	....	200	......	..	....	87½	87½	836	1 75
Totals........	....	....	....	....	....	..	......	..	......	34	104	13	....	......	113	..	....	......	......	17,865	....
Averages........	....	....	....	....	....	..	......	..	......	.....	.....	....	....	141	......	..	....	$0 80	$0 80	....	$1 44.6

WARREN COUNTY—SECOND DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
John Simcock	Alexis	Shaft	Horse	40	4	1	P R.	2	Nat'l.	2	5	1	....	180	45	..	....	$0 87½	$0 87½	1,620	$1 75
J. A. Rohr	"	Drift	Hand	....	3.6	1	"	2	"	1	3	....	....	160	......	..	....	1 00	1 00	800	1 75
William Cook	"	Shaft	Horse	45	4	1	"	2	"	1	3	1	....	150	20	..	....	87½	87½	480	1 75
John Young	Monmouth	Drift	Hand	....	2.6	1	"	2	"	2	7	....	....	160	6	..	....	1 25	1 25	1,400	1 75
William Chicken	"	Shaft	Horse	60	2.6	1	"	2	"	....	3	1	....	100	5	..	....	......	1 25	600	1 75
Thomas Swan	"	"	"	26	2	2	"	2	"	3	5	1	....	180	......	..	....	1 25	1 25	1,188	2 00
Thomas Hubbard	"	Drift	Hand	....	2	2	"	2	"	2	5	....	....	160	......	..	....	1 25	1 25	800	2 00
William Packard	"	Shaft	Horse	20	2	2	"	2	"	1	2	1	....	160	......	..	....	1 25	1 25	588	2 00
Alfred Romine	Youngsworth	Slope	Hand	20	2	2	"	2	"	2	5	....	....	160	......	..	....	1 25	1 25	720	1 75
Joseph Wilson	"	Drift	"	....	2	2	"	2	"	....	5	....	....	100	......	..	....	......	1 25	500	2 00
Thomas Wearmouth	"	"	"	....	2	2	"	2	"	....	4	....	....	100	......	..	....	......	1 25	400	1 75
Thomas Lee	"	Slope	"	24	2	2	"	2	"	....	2	....	....	100	......	..	....	......	1 25	320	1 75
O. H. Stewart	"	"	"	15	2	2	"	2	"	....	2	....	....	100	......	..	....	......	1 25	200	1 75
Robinson Wilson	"	"	"	15	2	2	"	2	"	....	2	....	....	100	......	..	....	......	1 25	180	1 75
J. W. Booten	Swan Creek	"	Horse	20	2	2	"	2	"	2	4	....	....	160	......	..	....	1 25	1 25	800	1 75
W. S. Moler	"	"	"	18	2	2	"	2	"	3	6	....	....	180	......	..	....	1 25	1 25	900	1 75
Joseph Simpson	"	Drift	Hand	....	2	2	"	2	"	....	1	....	....	100	......	..	....	......	1 25	100	1 75
Joseph White	Roseville	Slope	"	20	2	2	"	2	"	....	7	....	....	100	......	..	....	......	1 25	1,000	1 75
L. K Lammerts	"	Shaft	Horse	74	2.6	2	"	2	"	....	5	1	....	100	......	..	....	......	1 25	250	2 00
Michael Burke	"	Slope	Hand	15	2	2	"	2	"	....	2	....	....	100	......	..	....	......	1 25	120	1 75
J. T. Bragg	"	"	"	16	2	2	"	2	"	....	3	....	....	80	......	..	....	......	1 25	120	2 50
Thomas Emmerson	"	"	"	10	2	2	"	2	"	....	1	....	....	100	......	..	....	......	1 25	90	2 00
Henry H. Lyen	Kirkwood	Shaft	Horse	25	2	2	"	2	"	2	6	1	....	200	......	..	....	1 50	1 50	634	2 25
Totals	....	....	....	....	....	..	....	..	....	21	88	7	....	......	76	..	....	......	......	13,810	......
Averages	....	....	....	....	....	..	....	..	....	....	....	....	....	132	......	..	....	$1 16.6	$1 16.6	......	$1 84

RECAPITULATION BY COUNTIES—SECOND DISTRICT—1887.

Counties.	Total No. of mines	No. of mines shipping coal	No. of mines local	Kinds of power employed.			Kinds of openings.			Modes of working coal.				No. of miners and other employés.			No. of mules under ground	Average No. of days worked	No. of kegs of powder used	No. of men killed	No. of men injured so as to lose time	Average price per ton paid for mining		No. of tons of coal produced	Average price of coal per ton at the mines	No. of mines with escapement shafts	No. of mines without escapement shafts	Kinds of power used for ventilation.			
				Steam	Horse	Hand	Shaft	Slope	Drift	Pillar and room	Long wall	Single entry	Double entry	Miners, summer	Miners, winter	Other employés						Summer	Winter					Fan	Furnace	Steam jet	Natural
Bureau	22	5	17	7	13	2	17	5	....	16	6	21	1	692	1,008	199	196	56	499	4	5	$0 90 1	$0 90.1	429,580	$1 40	17	5	5	13	..	4
Hancock	6	1	5	1	4	1	5	....	1	5	1	6	....	10	33	6	157	...	......	..	1	1 02.1	1 06.9	6,208	1 65.3	5	1	..	..	..	6
Henry	27	5	22	8	12	7	16	4	7	27	..	16	11	a 174	b 396	57	170	8	312	..	3	81.7	87	117,533	1 50.6	26	1	3	8	5	11
Knox	39	1	38	1	17	21	11	7	21	39	..	37	2	101	263	42	151	4	25	..	1	91	80.9	64,324	1 29.8	37	2	..	10	..	29
Marshall	20	1	19	1	1	18	2	....	18	19	1	20	....	138	194	31	125	5	57	..	3	89.8	89.8	73,928	1 48.5	18	2	1	..	..	19
McDonough	63	8	55	10	9	44	17	3	43	63	..	54	9	350	532	37	125	....	......	1	10	1 09.6	1 33	110,103	1 63.7	61	2	3	4	2	54
Mercer	21	4	17	5	14	2	16	3	2	21	..	19	2	233	413	204	152	34	5,202	..	3	86 9	91.4	127,608	1 68	20	1	3	..	..	18
Rock Island	24	4	20	6	9	9	11	4	9	24	..	21	3	163	295	65	167	16	2,403	..	....	83.1	85.4	85.282	1 72.3	23	1	1	3	4	16
Schuyler	7	1	6	1	2	4	2	1	4	7	..	6	1	39	71	11	140	3	837	..	....	72.2	71.4	22,686	1 11	6	1	1	1	..	5
Stark	23	..	23	....	13	10	11	2	10	23	..	22	1	34	104	13	141	....	113	..	....	80 3	80	17,865	1 44.6	21	2	..	1	..	22
Warren	23	..	23	....	9	14	7	10	6	23	..	23	....	21	88	7	132	....	76	..	....	1 16.6	1 16.6	13,810	1 84	23	0	..	..	..	23
Totals	275	30	245	40	103	132	115	39	121	267	8	245	30	1,955	3,396	672	....	126	9,524	5	26	....	....	c 1,069,027	......	257	18	17	40	11	207
Averages	...	..	...	....	....	....	....	....	....	....	..	....	....	......	......	....	150	....	......	..	....	$0 90.4	$0 93.8	....	$1 49.6	....	....	..	..	..	....

a 30 working with machines not included in this average.
b 40 working with machines not included in this average.
c 54,550 tons not included in averaging prices for mining.

Number of new mines opened 1
Number of mines permanently abandoned 1

THOMAS HUDSON, *State Inspector*.
GALVA.

THIRD DISTRICT.

Mr. John S. Lord,

Secretary of the Bureau of Labor Statistics of Illinois.

Sir: In compliance with the law defining the duties of mine inspectors, I herewith present the fourth annual report of the inspector for the Third district.

This report includes a statement of the general condition of the mines, showing the number of tons of coal produced during the year, the methods of ventilation used and the improvements made therein; the number of new escapements which have been sunk; the number of strikes, their duration and effect; a list of fatal accidents, with their causes; and finally, suggestions as to legal enactments which in my opinion would add to the health and safety of the miners.

On entering upon my commission October 1, 1885, I received valuable assistance from my friend and predecessor, Mr. John Rollo, who took great pains to give me items of importance regarding the condition of the mines, the improvements in progress, and where my services were most needed.

In taking a general survey of the improvements completed and those in progress, I must say that the larger mines are fairly well equipped as regards escapements and other safety appliances, which the law calls for to protect the lives of those employed in and around coal mines. My time and attention was principally occupied at these mines on my first and second visits, showing the mine operators and managers the necessity for an increase in the amount of ventilation, and having the air properly conducted into the working faces, as called for by section four of the mining law. The prevailing custom has been to allow the air to flow along the one entry to the last cross-cut, and then return along the other entry. By this means the amount of air that goes into the rooms, even although there are the required number of cross-cuts between them, is a very small proportion of the main current of air passing along the entry, and the current is perceptible only when the coal cars are standing on the entry, or traveling against the air current. At other times the flow of air into rooms is scarcely noticeable. More especially is this system of conducting the air through the mines inadequate where, as is sometimes the case, the mining of every ton of coal involves the explosion of at least a pound of blasting powder, the miners having at times to work in a cloud of standing smoke.

I have been obliged to point out to mine managers the necessity and benefit of having swinging doors or curtains, so as to force the air currents into the working faces. These doors or curtains do not require to be air-tight, but just sufficiently tight to direct the proper amount of air through the rooms, carrying away all the smoke and such other impurities as are given off. It is by something like this system of conducting the air around the working faces that the spirit of the mining law is realized, and the healthful part of it carried into good effect.

The swinging doors referred to are items of small expense, and mules can be taught to use them, the doors being so hung as to open both ways, and swing back into place automatically. I am glad to say that almost all of the larger mines in this district are now using either doors or curtains, and have established a uniform time for the miners to shoot down their coal. This is generally at noon and at quitting time, so that the miners have not one-fifth of the powder smoke to work in they would otherwise have.

I also found in some mines the practice of allowing the entry men to partly fill up one cross-cut with debris, before completing the next, thus interfering with the passage of air through that opening. In some cases I have been obliged to creep through such places on my hands and knees, when the height of the coal was six feet. I have drawn attention to this violation of the law, and forbidden it in future. Another matter which is often overlooked is the condition of airways, especially of those neither used as hauling nor traveling ways, and which are generally the return air-courses. While inspecting such passages in company with the pit-bosses, it is not unusual to find falls of rock or other debris, which it is generally claimed are of recent occurrence, and not previously discovered, but the soot and dust on the surface of the fallen rock show that it had been accumulating for a long period.

I have been urging the advantages of allowing the track to remain in such passages. In large mines, where the roof is not strong, the benefits would more than equal the money invested. Such falls of rock are often roughly levelled down or packed along the sides, thus materially reducing the area of the airway. In some instances I have seen men sent in with wheelbarrows to remove such obstructions, and have seen men carry props a distance of one or two thousand feet in a passage where one prop was a good load. By retaining the track in such places handy transportation of tools, material and rock by car would be secured. Much of this carelessness is the result of ignorance of the laws of ventilation.

During the last two years there have been eighteen new fans erected in this district. Six of them have taken the places of fans which were too small for the purpose, four have replaced furnaces, and the rest have been put on new openings.

Another great improvement has been secured in the smaller mines, in the increased number of furnaces for ventilation, and in the decrease in the use of natural methods of ventilating, as the following figures will show:

Mines ventilated by natural process in 1886	112
Mines ventilated by natural process in 1887	71
Decrease	41
Mines ventilated by furnaces in 1887	125
Mines ventilated by furnaces in 1886	78
Increase of furnaces	47

During the winter the furnaces are not much needed where the number of miners varies from two to eight, but in the summer and at midday in the fall when the temperature outside ranges from 10 to 60 degrees higher than the temperature in the mine a furnace is required to disturb the equilibrium formed, and cause a circulation of air through the mine.

There have been fifty-two escapement shafts completed during the year, the most important of which are at the following places: Mt. Pulaski Coal Mining Co., Mt. Pulaski; Citizens' Coal Mining Co., Lincoln; Hanna City Coal Co., Hanna City; S. H. Swallow, Glenburn; Peter Grant & Sons, and Royster Brothers & Co., Peoria. The following companies have had to sink new air shafts close to the working faces to increase the quantity of air. The Petersburg Coal Co., and J. Wilkins & Co., Petersburg; Collier's Co operative Coal Co., and Millard & Wallslag, Peoria, and the Cuba Union Coal Co., Cuba.

There have been sixty-seven additional mines added to the list of this district in the two years. A large number of this increase are small mines in remote parts of the counties, and recently visited for the first time. The principal new openings are those of the Bloomington Co-operative Coal Co., Bloomington; Cuba Co-operative Coal Co., Cuba; the German Co-operative Coal Co., at Orchard Mines; the Star Co-operative Coal Co., Enterprise Co-operative Coal Co., and Royster Brothers & Co., Peoria; Wesley City Co-operative Coal Co., Wesley City; Menard County Coal Co., Greenview; S. H. Swallow, Glenburn, and Emerson & Co., St. David. The last named company has bought about 600 acres of coal land one and a half miles south of the town of St. David, and has laid a branch railroad two miles long to the mine from the Buda and Rushville branch of the C., B. & Q., which passes through the town of St. David. They have sunk and equipped a fine hoisting shaft, striking a fine seam of coal 4 feet 8 inches thick at a depth of 90 feet. They have put in a pair of good hoisting engines, four cylindrical sheet boilers, Cherry's self-dumping cages, Ramsay's box-car loader, and other late improvements. They have also just placed in position at the mine a Norwalk air compressor, as they intend operating the Legg mining machine to undermine the coal.

The Eureka Coal Co. claims to have found, in boring, a seam of coal 360 feet from the surface. It is claimed to be No. 2 seam which is 30 inches thick with 15 inches of cannel coal on top, making in all 3 feet 9 inches in thickness. In sinking they struck a sand bed 15 feet deep containing considerable water 70 feet below the surface. Two attempts were made to pass through this sand bed, but both were unsuccessful, and the stockholders became discouraged, and let it stand. Recently, however, an offer was made to put the shaft through the sand for a given sum; the company accepted the offer and in six weeks the work was completed. The company then closed the mine indefinitely.

The Sidney Coal Co., Sidney, Champaign county, sunk a shaft 256 feet. expecting to find 6 feet of coal as reported by the party who drilled the prospecting hole, but they really found only 3 feet, and a large portion of that was very impure and not marketable. This shaft was sunk in October, 1885, and two parties have since tried to operate it but failed to make it pay.

The amount of coal business done in this district last year was larger than that of the previous year, but notwithstanding the increased business the miners have not been able to secure steady employment. If the Grape Creek and St. David mines had been operated with the usual number of practical miners, the output for this district would have been nearly two million tons. The following table will give a statement as to the increase or decrease in each county compared with 1886.

Counties.	Tons for 1886.	Tons for 1887.	Increase.	Decrease.
Peoria	386,852	452,123	65,271	
Vermilion	305,679	359,119	53,440	
Fulton	238,542	335,215	96,673	
Logan	180,000	159,000		21,000
Menard	127,464	155,621	28,157	
McLean	120,600	141,700	21,100	
Woodford	121,200	122,445	1.245	
Tazewell	34,881	51,847	16,966	
Cass	3,227	2,325		902
Totals	1,518,445	1,779,895	282,852 21,902	21,902
Total increase			260,950	

Number of miners employed in 1886	4,020
Number of miners employed in 1887	3,982
Decrease	38
Number of other employés about the mines in 1887	922
Number of other employès about the mines in 1886	850
Increase	72

Owing to the late general depression in the coal business the average prices for mining and selling coal have fallen off considerably; and the new mines that have been opened, especially near Peoria, during the last two years have made competition very close. Before the new companies could get a foothold in the market they had to do some undercutting in prices which reduced the prices for coal to an unprofitable figure for the producers. As an example, one of our coal companies took an important contract to furnish coal for one year for 87½ cents per ton at the mine, while paying 9½ cents per ton royalty. Other operators have taken contracts recently at about the same figures. There is no doubt that the operators could not pay the present prices for mining were it not for the profits of their stores, and on blasting powder and oil. The depression and competition in the business has made a large portion of the operators near Peoria anxious to lease their mines to the miners, the latter to pay a given sum per ton royalty, and for the use of the machinery and plant. Quite a number of the miners have taken advantage of this offer which has increased the number of co-operative mines to eight within a radius of five miles of Peoria. The plan, that they work on, as I understand it, is for each one to take his share of the dead work, as it comes, and the only remuneration for such on pay day is the satisfaction of knowing that the stock should be increasing in value. I have seen some of the men who were anxious to quit and willing to dispose of their stock at 25 cents on the dollar, but could find no purchaser even at that reduction. The cause of this is the selling of the coal below what it costs for mining and keeping the mine in order. Some of the less intelligent among the miners are claiming that the single entry system is as good for conducting ventilation through a mine as the double entries, their real point being that it costs only one-half as much for entry driving. But it never will conduct the air as efficiently through a mine. It costs nearly as much for doors and cross-cuts between the doors as double entries, yet the air is poorly conducted.

The relations between employers and employés at quite a number of the mines are far from being harmonious. This feeling is attributable to a certain extent to the depression in business. The effort made eighteen months ago by the operators and miners of this and other States to regulate the prices for mining was taken advantage of by only a few in this district. The most of the operators are making the best terms possible with their men for a uniform price for a year, as will be seen from this year's tabulated report. The summer and winter prices for mining are the same with a very few exceptions.

The operators around Peoria held a series of meetings a year ago for the purpose of forming a pool to maintain better selling prices, but failed to agree. They managed, however, to pass a resolution to reduce the price of mining from 75 to 62½ cents per ton. Within this last summer they have been more successful in pooling, but between the Lincoln Coal Companies on the one hand and the Mapleton on the other, they have not dared to advance the selling prices, as these companies were prepared to ship in coal whenever they could do so without losing money.

There have been but few strikes in this district during the last year, though both the strikes at Grape Creek and at St. David, which originated the year before, have been pending the greater part of this year, the former being still unsettled.

On January 25, 1887, the miners employed by the Wesley Coal Co., Adam Sholls, Chapman & Little, John Gorman, Millard & Woolslag, E. S. Wilcox, and Peter Grant & Sons, Peoria, came out on a strike demanding that the 12½ cents per ton be restored which was taken from them in July, 1886. There were about 260 striking miners in all. In the month of March, the operators having heard of the negroes as being useful in defeating strikes, dispatched an agent to Grape Creek who brought over about 100. These were distributed among the mines at which there were strikes, but they failed as in Grape Creek to be fair coal producers. The negroes, however, did not fail to give the company stores their daily visit. In April some of the operators offered to lease the mines to the old miners to be worked on the co-operative plan. Three of the miners accepted. The other miners were almost all at work by May, some operators paying 65 cents per ton and others 70 cents.

There have been various strikes over the district lasting from two days to a week, on such questions as screens, checkweighmen, victimizing, etc., which are hardly deserving of special mention.

In March, of this year, the Bloomington Co-operative Coal Co., at Bloomington, closed their mine because of financial embarrassment. The origin of this co-operative coal company was through a strike of the miners employed by the McLean County Coal Co., in 1885. About 100 of the striking miners formed a company leasing some coal land one mile west of town. They then began sinking a shaft, having engaged an expert sinker to superintend the work. When they were down 50 feet they encountered 10 feet of quick-sand containing a quantity of water, the bed lying at an angle of one in seven, which made it more difficult to pass through. After several attempts and as many changes of superintendents, they finally passed through. When they reached a depth of 287 feet they struck No. 6 coal seam, which was 3 feet 8 inches in thickness. They then erected a tower, screens, etc., and commenced to operate the mine on the long-wall system, their business being all local and town trade. As they could not afford to pay the railroad company for a switch they were never able to ship by rail. In the fall of 1886, the principal creditors applied to the court for a receiver. Their petition being granted, the court appointed Mr. Charles E. Perry, agent of the Bloomington Mill Co., at Bloomington, who, after consulting mining experts as to the amount of capital it would require to equip the mine with more efficient machinery and to develop the mine to a paying basis, applied to the court for a permit to raise the required amount of capital, but was refused. He then put it back into the court to be sold, as it could not be made to pay the running expenses. It was closed down on March 12, 1887, and afterward sold at auction. The amount of money which it is claimed was expended in sinking and equipping the mine shows clearly the lack of judicious management, or as claimed by some, shows that co-operation can only be made successful in distribution, not in production.

LEGISLATION.

I would earnestly recommend the passing of a measure governing the quantity of blasting powder that shall be allowed in a mine, and the manner of taking it into the mine. Quite a number of fatal and non-fatal accidents are occurring every year to miners from the careless handling of large quantities of powder. I would also recommend a measure compelling all mine managers having charge of a mine, operating 10 or more men, to pass an examination as to their competency to fill such a position. This would have a tendency to improve the condition of the mines as much as any measure yet passed. I would also suggest that a measure be passed compelling coal operators having shafts where workmen are lowered and raised by cages and steam power, to have a competent person appointed to examine every morning before working hours the cages, cage covers, safety catches, chains, and hoisting ropes, such examiners to make a daily record of their conditions immediately after such examination in a book kept for that purpose at the mine.

Accidents.

I am glad to say that the number of fatal accidents is small this year compared with the preceding year. Two have been occasioned by pit-cars, two have been caused by falling rock, and one by falling coal. These may be classed as outside the power of legislation. When miners are properly supplied with props and cap-pieces it is an understood thing that they are the guardians of their own welfare. However, I look for good results from the law passed by the last legislature compelling a system of daily inspection before the miners are allowed to enter the mine to work, such inspection to be made by a duly authorized agent of the operator. These inspections, if properly made by a competent person, will be useful in giving timely warning to the miners in the morning as they go to their work, each receiving such personal caution as may have been found necessary by the inspector. It is by such precautionary warnings from competent and reliable mine examiners, especially to the inexperienced miners, that the number of accidents may be very much reduced.

The number of non-fatal accidents for the year, however, is large, but when we take into consideration the large number of inexperienced miners who have been brought into the coal fields in this district to take the places of the striking miners, the wonder is not that they are so many, but that they are so few.

There is one death which took place in the mines which I have not classed among the fatal accidents. It was that of John Tanner. He was employed as an entry driver in Adam Sholl's mine, Peoria. On August 14, 1886, between two and five P. M., he quit work and walked out the main entry. Coming to an old and disused branch entry, the mouth of which was filled up to within about a foot of the roof with rock and debris, he crawled into it, was overcome with gases and was found dead.

Fatal Accidents.

On September 16, 1886, William Farrell, aged 18 years and single, was injured in the McLean County Coal Company's mine at Bloomington from the effects of which he died on the 26th of the following October. The deceased was trip-runner on the cable rope for two years and had just asked the pit-boss for a change to mule driving in order to obtain higher wages. His request was complied with and on the first day of the change and on his sixth trip he miscalculated his whereabouts in coming into the parting and jumped off his car in the wrong place and was caught between the cars and the entry side and crushed so badly that he died.

✓ On December 28, 1886, John Riley, aged 30 years, married and having four children, employed by the Chicago and Minonk Coal and Coke Company as a miner, was killed by falling rock. The deceased and his partner were working on the night shift in an entry. About 3 A. M., a piece of rock weighing about one ton partly fell on him. He had discovered a slip in the roof and had just put a prop under the bad rock, but the prop was under the light side of the rock which possibly made the rock come down sooner than it otherwise would. His partner brought him out to the bottom where he obtained assistants to take him home, but he expired in an hour after his arrival there.

✓ On February 2, 1887, Christopher Yarling, aged 38 years, married and the father of four children, and employed as a miner by the Consolidated Coal Co. of St. Louis at Danville, was fatally injured by top coal falling on him. The deceased and his partner had deemed the overhanging coal quite safe, and were preparing another blast to undermine the top coal further when it fell on Yarling. He only lived long enough to call for and take a last drink.

✓ On February 25, 1887, William O'Hara, aged 25 years and single, was employed as a mule driver by the McLean County Coal Co., at Bloomington, his duty being to pull trips to and from the cable rope to the pit bottom. While starting up a loaded trip his feet became entangled in the mule's hitching chain and he was thrown backwards, his head striking heavily against the front car, from the effects of which he died the same day.

On the 26th of June, 1887, David Curran, aged 45 years and single, employed as a miner by Adam Sholl, Peoria, was fatally injured by a fall of rock weighing about two tons. The deceased and his partner had fired a shot which knocked out three props. On returning to the room they concluded to fill the coal car before resetting the props, but while in the act of filling the car the rock fell on Curran killing him instantly. There was a "horseback" running across the room which made the roof faulty. He and his partner were inexperienced miners, having come into the mine only a few weeks previous, after being on a railroad construction gang.

The record of the non-fatal accidents will be found in the following table.

Very Respectfully,

JAMES FREER,

Inspector 3d District.

PEORIA.

List of 40 Non-fatal Casualties in the Third District.

Date.	Name.	Place.	Age	Married	Single	Children.	Cause of Accident.	Time lost.
1886.								
June 6	Braur, H	Minonk	24	..	1	..	Body bruised by falling rock	10 days
Aug. 15	Nicklaw, William	Roanoke	30	1	..	3	Angle injured by falling coal.	3 W.
Sept. 3	Fitzgerald, John	Minonk	38	1	..	4	Body injured by falling rock.	1 Mo.
" 24	Esslinger, Charles	Blount	19	..	1	..	Arm burned by premature shot	4 W.
" 28	Keenan, Hugh	Minonk	24	..	1	..	Back and arm injured by cable rope	6 Mo.
Oct. 19	Mason, W. M	Gr'pe Creek.	27	..	1	..	Bruised by falling rock	3 W.
" 26	Kennedy, Patrick	Cuba	42	..	1	..	Ribs broken by falling coal	4 W.
Nov. 9	Grosswiler, Joseph	Pekin	21	..	1	..	Leg broken by pit-cars	3 Mo.
" 13	Carlson, Charles	Bloomingt'n	19	..	1	..	Foot injured by falling coal	1 Mo.
" 15	White, Edward	Minonk	49	1	..	7	Legs and body bruised by falling coal	7 W.
" 16	Fitzgerald, John	"	37	1	..	2	Back injured by falling rock.	3 W.
" 16	Dacey, Michael	Lincoln	20	..	1	..	Leg injured by pit-car	1 Mo.
Dec. 4	Tower, Frank	Gr'pe Creek.	36	1	..	.	Leg injured by falling coal	15 days
" 8	Bohaman, Robert	Mapleton	29	..	1	..	Leg and body injured by pit-car	7 Mo.
" 12	Stolls, Charles	Bloomingt'n	23	..	1	..	Leg broken by falling rock	11 W.
" 13	Powers, John	Minonk	25	..	1	..	Leg bruised by falling coal	6 W.
" 16	Williams, James	Gr'pe Creek.	28	..	1	..	Leg broken by falling rock	3 Mo.
1887.								
Jan. 13	Smith, J. D	Norris	32	1	..	2	Leg broken by descending cage	12 W.
" 17	Skully, William	Peoria	28	1	..	3	Ankle bruised by falling coal	3 W.
" 19	Stephenson, Phillip	Gr'pe Creek.	19	..	1	..	Leg broken by pit-cars	10 W.
Feb. 1	Bross, Fred	Pekin	24	..	1	..	Back injured by falling rock.	2 Mo.
" 3	Canter, Louis	Danville	30	..	1	..	Hand injured by pit-cars	5 W.
" 3	Johnston, David	Bloomingt'n	30	..	1	..	Leg broken by falling coal	3 Mo.
" 8	Smith, Samuel	Lincoln	32	1	..	2	Foot injured by pit-cars	3 W.
" 14	Pyles, E	Gr'pe Creek.	21	..	1	..	Arm bruised by falling rock.	10 days
" 22	Johnston, Fred	Greenview	30	1	..	2	Hip bruised between pit-cars	2 W.
Mar. 3	Fromces, Harman	Petersburg,	40	1	..	3	Back bruised by falling rock	1 Mo.
" 19	Smith, Patrick	Minonk	17	..	1	..	Back and legs injured by falling rock	4 Mo.
" 24	Good, Robert	Danville	20	..	1	..	Back injured by decending cage	Idle
" 26	Walker, Charles	Gr'pe Creek.	24	..	1	..	Leg broken by pit-cars	3 Mo.
April 26	Ralston, A. G	Bloomingt'n	26	..	1	..	Leg broken by falling coal	14 W.
" 26	Breeder, Thomas	Greenview	27	..	1	..	Head and shoulders injured by falling rock	5 W.
May 3	Gilear, Thomas	Edwards	18	..	1	..	Shoulder bruised by falling rock	4 W.
" 10	Robinson, Samuel	Gr'pe Creek,	19	..	1	..	Foot injured by pit-car	21 days
" 17	Sirock, George	"	22	1	..	2	Injured by falling rock	....
" 28	Ulman, Benjamin	"	30	1	..	3	Arm broken by falling rock.	2 Mo.
" 31	Small, James	Minonk	35	1	..	3	Collar bone broken by falling rock	2 Mo.
" 31	Connor, Charles	"	51	1	..	4	Back and legs injured by pit-car	11 W.
June 17	Bodme, August	Roanoke	16	..	1	..	Leg broken by falling coal	12 W.
" 17	Collier, Joseph	Peoria	35	1	..	1	Spine injured by falling rock	Idle.
Totals			..	15	25	41		48 Mo.

RECAPITULATION OF NON-FATAL CASUALTIES.

Cause of Accidents.	No.	Per cent.
Cable rope	1	2.5
Cage	2	5
Falling coal	10	25
Falling rock	16	40
Pit cars	10	25
Powder	1	2.5
Totals	40	100.00

CASS COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise?	Number of miners employ'd — Summer	Number of miners employ'd — Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining — Summer	Price per ton paid for mining — Winter	No. of tons of coal produced	Average value of coal per ton at the mine
J. S. & G. S. Russell	Ashland	Shaft	Steam.	205	2.6	5	L. W.	2	S.Jet	4	8	2	....	125	24	..	....	$0 87½	$0 87½	940	$1 25
Wm. Shores	Chandlerville	"	Horse.	40	2.8	5	P. R.	2	Nat'l	1	2	....	....	180	......	..	....	1 00	1 00	480	1 50
Wm. Hinchcliff	"	"	"	25	2.8	5	"	2	"	1	2	....	....	160	......	..	....	1 00	1 00	345	1 50
H. Hinchcliff				40	3	5	"	2	"	2	2	....	....	200	......	..	....	1 00	1 00	560	1 50
Totals										8	11	2	....	......	24	..	....	......	......	2,325	......
Averages														166	......	..	....	$0 95	$0 95	......	$1 39.9

FULTON COUNTY—THIRD DISTRICT—1887.

		CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd, Summer	Number of miners employ'd, Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining, Summer	Price per ton paid for mining, Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Emerson & Co	Astoria	Shaft	Steam.	80	6	5	P. R.	2	Fan	100	110	20	10	231	2,236	..	....	$0 67½	$0 67½	85,628	$1 00
Green & Co	‘‘	‘‘	Horse.	40	6	5	‘‘	2	Fur	3	6	1	....	109	29	..	....	67½	67½	843	1 25
Thomas A. Markham	‘‘	‘‘	‘‘	20	6	5	‘‘	2	‘‘	1	3	1	....	100	7	..	....	67½	67½	400	1 25
Choikly & Baghtol	‘‘	Slope	‘‘	40	6	5	‘‘	2	‘‘	2	2	....	1	210	12	..	....	67½	67½	580	1 25
Robert Roddis	Ipava	Drift	Hand	40	5.8	5	‘‘	2	‘‘	2	3	....	....	275	36	..	....	75	75	1,200	1 12½
Francis Duffy	‘‘	‘‘	‘‘	25	5	5	‘‘	2	‘‘	2	4	....	....	230	......	..	....	1 00	1 00	541	1 25
Notman & Beghtol	‘‘	Shaft	Horse.	30	5	5	‘‘	1	Nat.	2	2	....	....	120	......	..	....	75	75	389	1 12½
Henry Florance	Lewistown	Drift	Hand.	70	2.6	1	‘‘	2	‘‘	3	6	1	....	250	10	..	....	1 00	1 00	1,200	1 25
John Wickell	‘‘	‘‘	‘‘	50	2.6	1	‘‘	2	‘‘	2	2	....	1	200	6	..	....	1 00	1 00	860	1 25
Isaac Bath	‘	Slope	Horse.	50	2.6	1	‘‘	2	‘‘	.....	2	....	....	90	4	..	....	1 00	1 00	378	1 25
Bryant Coal Co	Bryant	Shaft	Steam.	40	5.6	5	‘‘	2	Fan	20	40	5	3	225	250	..	....	70	70	20,847	1 15
Taylor Williams	St. David	‘‘	‘‘	62	5	5	‘‘	2	‘‘	70	85	10	6	217	1,481	..	....	70	75	24,039	1 00
Emerson & Co	‘‘	‘‘	‘‘	90	4.8	5	‘‘	1	‘‘	12	.....	4	....	30	31	..	....	70	75	760	1 00
A. H. Heald	Canton	‘‘	‘‘	70	4.10	5	‘‘	2	‘‘	40	50	15	4	284	1,500	..	....	70	70	36,225	1 00
West Canton Coal Co	‘‘	‘‘	‘‘	80	4.8	5	‘‘	2	‘‘	10	35	6	2	210	451	..	....	70	75	10,975	1 10
J. & R. Savil	‘‘	‘‘	‘‘	50	4.8	5	‘‘	2	‘‘	4	6	2	....	267	150	..	....	70	75	3,103	1 37½
Isaac Whitehouse	‘‘	‘‘	Horse.	45	4.6	5	‘‘	2	Fur.	1	3	1	....	290	71	..	....	75	75	1,296	1 12½
Louis Bell	‘‘	‘‘	‘‘	54	4.6	5	‘‘	2	‘‘	2	5	1	....	200	85	..	....	75	75	1,460	1 25
Jesse Williams	‘‘	‘‘	‘‘	30	4.9	5	‘‘	2	‘‘	2	4	1	....	186	60	..	....	75	75	967	1 25
Minett & Stephens	‘‘	Slope	‘‘	45	4.6	5	‘‘	2	‘‘	2	2	....	1	190	20	..	....	75	75	520	1 25
Wedge Brothers	‘‘	Drift	Hand.	60	4.6	5	‘‘	2	‘‘	2	4	....	....	230	56	..	....	75	75	1,046	1 25
Ed. Canthrell	‘‘	‘‘	‘‘	60	4.6	5	‘‘	2	‘‘	1	2	....	....	134	12	..	....	75	75	324	1 25
L. L. Jones	‘‘	‘‘	‘‘	55	4.8	5	‘‘	2	‘‘	.....	4	1	1	100	8	..	....	....	75	1,268	1 00
Jackson & Vanslyck	‘‘	‘‘	‘‘	48	4.8	5	‘‘	2	Nat.	2	3	....	....	130	30	..	....	75	75	1,032	1 00
John Bennett	‘‘	Slope	Horse.	60	4.6	5	‘‘	2	Fur	1	3	....	1	140	29	..	....	75	75	760	1 25
C. Savil	‘‘	‘‘	‘‘	35	4.6	5	‘‘	2	Nat	.....	2	....	1	90	10	..	....	....	75	264	1 25
John Jardine	‘‘	‘‘	‘‘	40	4.2	5	‘‘	2	‘‘	.....	2	....	....	90	6	..	....	....	75	188	1 25
John Dawson	‘‘	Shaft.	‘‘	30	4.2	5	‘‘	1	‘‘	.....	2	....	....	60	......	..	....	....	75	210	1 25

Jacob Smith	Canton	Drift	Hand	30	4.2	5	P. R.	2	Nat.	1	2			136	10			75	75	300	1 25
Pat Meechan	Breeds	"	Horse	50	4.8	5	"	2	Fur.	20	40	6	2	220	300			65	75	9,000	1 05
G. W. Hindson	"	"	"	40	4.8	5	"	1	Nat.		4	1		95	30				75	670	1 00
Joseph Whitehead	Farmington	Shaft	Steam	165	4.6	5	"	2	Fan.	25	40	8	4	200	835			70	75	15,700	1 05
Wm. Raffle	"	"	Horse	33	4.2	6	"	2	Fur.	1	3	1		180				62½	62½	860	1 00
M. Berry	"	Drift	Hand	40	4.2	6	"	2	Nat.		2			120					62½	500	1 00
Wm. Ross	"	"	"	55	4.2	6	"	2	"		2			90					62½	245	1 00
Taylor Williams	Norris	Shaft	Steam	112	4.8	6	"	2	Fan.	43	77	15	4	289	1,305		1	70	80	29,237	1 10
John Dunton	"	"	Horse	75	4.8	6	"	2	Fur.		4	1		120	18			70	80	500	1 25
Charles Drawyer	"	Drift	Hand	60	4.4	6	"	2	Nat'l.	1	2			100				70	80	295	1 25
James Stirret	Cuba	Shaft	Steam	60	4.8	5	"	2	Fan.	25	45	8	3	182	397			65	75	20,658	1 12½
Cuba Union Coal Co.	"	"	"	80	4.8	5	"	2	Fur.	10	14	4	1	175	160			65	75	5,800	1 00
Cuba Co-operative Coal Co	"	"	"	42	6	6	"	2	"	4	12	3		160	124			65	75	4,200	1 12½
Wm. Rutherford	"	Slope	"	42	6	6	"	2	"	4	14	2	1	120				62½	75	9,000	1 12½
Wm. Nicheolson	"	"	Horse	40	4.4	5	"	2	"	2	6	1	1	130	260			62½	75	1,670	1 12½
Eagle Coal Co. No. 1	"	Drift	"	40	4.8	6	"	2	"	15	40	4	1	225	300		1	62½	75	6,400	1 12½
" " No. 2	"	"	"	50	4.8	6	"	2	"	3	3	1	1	312	62			62½	75	2,600	1 12½
Vlirt Brothers	"	Shaft	"	19	6	6	"	2	"	2	8	1		200	80			62½	75	3,895	1 12½
John Bolland	Seville	Slope	"	70	3.2	2	"	1	Nat.		4	1	1	110				75	1 00	640	1 25
John Anderson	Leaman	Drift	Hand	50	3	2	"	1	"	2				95				1 00		510	1 25
Frank Hubbell	Marietta	"	"	60	2.6	2	"	2	Fur.	2	6			190				1 00	1 00	1,200	1 25
Wilson Varner	"	"	"	40	2.6	2	"	2	Nat.	2	4			145				1 00	1 00	630	1 25
Charles Howard,	"	"	"	50	2.6	2	"	2	"		2			90					1 00	270	1 25
Ralph Burney	"	"	"	50	2.6	2	"	2	"	2	6			140				1 00	1 00	900	1 25
Wm. A. Hood	Bushnell	Shaft	Horse	30	2.8	2	"	2	Fur.	1	4	1		180				1 00	1 00	580	1 50
Mark Whitehead	Babylon	Slope	"	45	4.6	6	"	1	Nat.	2	8		1	200	50			87½	1 00	2,500	1 25
Green & Roberts	Fiatt	Drift	"	60	4.6	6	"	2	Fur.	4	12	2	1	180	150			62½	75	4,125	1 00
John Bennett	"	"	Hand	60	4.6	6	"	2	Nat.		2			100	25				75	600	1 12½
John Williams	"	"	"	50	4.6	6	"	1	"	2				120	18			62½		570	1 12½
Richard E. Gould	Fairview	"	"	75	4.6	6	"	2	Fur.	2	6			230				75	75	1,186	1 25
Theodore Pumpeas	"	"	"	60	4.6	6	"	2	"	2	5			200				75	75	1,000	1 12½
John Roots	"	"	"	45	4.6	6	"	1	Nat.	2				186				62½	75	270	1 00
J. H. Hamilton	"	"	"	20	4.6	6	"	2	"	1	2			200				62½	75	540	87½
Wm. Thorp	"	"	"	30	4.6	6	"	1	"		2			100					75	300	1 00
Samuel Parr	"	"	"	25	4.6	6	"	1	"		2			90					75	186	1 00
James E. G. Heibbard	"	"	"	40	4.6	6	"	1	"	1	2			162				62½	75	346	1 00
Jacob Sprinkler	"	"	"	30	4.6	6	"	2	"	1	2			268				62½	75	980	1 00
Josiah Karr	"	"	"	50	4.6	6	"	1	"		2			100					75	225	1 00
M. J. Stout	"	"	"	45	4.6	6	"	1	"		2			90					75	360	1 00
John Aberdusky	"	Slope	Horse	60	4.6	6	"	2	"		3	1	1	125					75	674	1 00
John Packer	"	"	"	55	4.6	6	"	1	"		2			100					75	200	1 00
S. A. Dray	"	Drift	Hand	40	4.6	6	"	1	"	2	6			230				62½	75	1,020	1 12½
M. C. Zimmerman	Middle Grove	"	"	30	4	6	"	2	"	1	3			200				62½	75	680	80
George Taylor	"	"	"	35	4	6	"	2	"		2			90					75	210	1 00
Jeff Burbridge	Farmington	Shaft	Steam	40	4.6	6	"	2	Fur.	6	20	4		230				62½	75	7,680	1 25
Totals										477	819	134	53		10,714		2			337,215	
Averages														166				$0 69.7	$0 73.3		$1 06.9

LOGAN COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individul operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd: Summer	Number of miners employ'd: Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining: Summer	Price per ton paid for mining: Winter	No. of tons of coal produced.	Average value of coal per ton at the mine
Lincoln Coal Mining Co	Lincoln	Shaft	Steam.	265	5	5	P. R.	2	Fan	60	85	32	10	300	2,916		2	$0 60	$0 60	70,000	$1 15
Citizens Coal Mining Co	“	“	“	267	5	5	“	2	“	70	100	30	6	280	1,800			60	60	65,000	1 15
Mt. Pulaski Coal Min. Co.	Mt. Pulaski	“	“	360	4.6	5	“	2	“	30	50	9	3	200	50			72	72	24,000	1 10
Totals										160	235	71	19		4,766		2			159,000	
Averages														260				$0 62.1	$0 62.1		$1 14.3

McLEAN COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individul operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd: Summer	Number of miners employ'd: Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining: Summer	Price per ton paid for mining: Winter	No. of tons of coal produced.	Average value of coal per ton at the mine
McLean County Coal Co	Bloomington	Shaft	Steam.	541	3.4	2	L. W	2	Fan	200	300	80	9	290	50	2	4	*a*	*b*	125,000	$1 20
Bloomington Co-operative Coal Co	“	“	“	289	3.8	5	“	1	Jet		36	14		175					$0 90	16,700	1 50
Totals										200	336	94	9		50	2	4			141,700	
Averages														233				$0 70	$0 81.5		$1 23.5

a Upper vein, summer, $0.60. *b* Upper vein, winter, $0.70.
Lower “ “ 0.80. Lower “ “ 0.90.

MENARD COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Greenview Coal Co.	Greenview	Shaft	Steam.	100	5.8	5	P. R.	2	Fan.	50	75	15	7	280	2,400	..	1	$0 60	$0 60	65,000	$0 95
Menard County Coal Co.	"	"	"	104	5.10	5	"	1	"	10	30	12	2	220	450	..	1	60	60	10,311	1 00
Petersburg Coal Co.	Petersburg	"	"	65	5.8	5	"	2	Fur.	20	55	10	5	200	785	..	....	62½	62½	28,000	95
J. Wilkens & Co	"	"	"	99	5.6	5	"	2	"	9	21	4	1	230	308	..	....	62½	62½	13,500	95
J. C. Cabanis	"	"	"	68	6	5	"	2	"	5	16	3	2	275	260	..	1	62½	62½	6,290	1 15
McDougal and Golden	"	"	Horse.	76	6	5	"	2	"	2	4	....	....	200	48	..	....	62½	62½	1,800	1 25
Levi Hohimer	"	"	"	75	6	5	"	2	"	1	2	1	....	240	36	..	....	62½	62½	1,100	1 25
William Parkin	Sweet water	"	"	170	6	5	"	2	"	2	5	1	....	290	82	..	....	62½	62½	2,120	1 50
A. Snell	Tiee	"	"	100	6.6	5	"	1	Nat'l.	1	1	....	....	78	12	..	....	75	75	300	1 75
Athens Coal Co.	Athens	"	Steam.	225	6	5	"	2	Fan	25	75	10	5	200	1,400	..	....	54	60	27,200	90
Totals	......	......	......	...	...	..	......	..	......	125	284	56	22	......	5,781	..	3	......	......	155,621	......
Averages	......	......	......	...	...	..	......	..	......	.....	.....	....	....	221	......	..	....	$0 59.8	$1 60.8	....	$0 96.7

PEORIA COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employes, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
G. W. Beathard	Lancaster	Drift	Horse.	120	4.7	5	P. R.	2	Fur.	25		10	2	119	398			$0 75	$0 75	11,551	$1 25
Frank Fanstock	Kingston Mines	"	"	90	4.4	5	"	2	Nat'l.		4		1	175	45			75	75	850	1 25
Jefford Bros	" "	"	"	100	4.4	5	"	2	"	6	2	1	1	200	71			75	75	1,600	1 25
Buckeye Coal and Coke Co. No. 1	Mapleton	Slope	Steam.	120	4.6	5	"	2	Fur		25	4	1	130	300			75	75	7,200	1 00
Buckeye Coal and Coke Co. No. 2	"	"	"	110	4.6	5	"	2	"	25	50	6	1	200	700		1	75	75	20,020	1 00
James Walker	"	"	"	140	4.6	5	"	2	"	15	30	5	2	195	700			75	75	9,800	1 10
John O'Shaughnessy	"	"	Horse.	90	4.6	5	"	2	"	6	30	3	2	150	300			75	75	9,126	1 00
H. Oddywalt	Orchard Mines	Drift	Hand.	70	4.6	5	"	2	Nat'l.		2			100	18			75	75	430	1 00
James Reagan	" "	"	"	60	4.6	5	"	2	Fur.		4			120	31			75	75	670	1 00
D. B. Robert	" "	"	"	60	4.6	5	"	2	"		2			90	21			75	75	370	1 00
F. Wheeler	" "	Slope	Horse.	80	4.6	5	"	2	"		3			125	15			75	75	400	1 00
E. C. Crandall	" "	Drift	Hand.	80	4.6	5	"	2	"		2			120	12			75	75	245	1 00
Engleke & Sholls	" "	Slope	Horse.	90	4.6	5	"	2	"	4	6	1	1	200	165			70	70	3,000	1 10
Thomas Lowry & Sons	" "	Shaft	Steam.	144	2.4	2	L. W.	2	Fan	30	8	3	1	206				1 00	1 00	5,400	1 25
German Co-op. Coal Co	" "	"	Horse.	45	4.8	5	P. R.	2	Fur	12	16	3	1	225	255			70	70	8,600	95
Adam Sholl	Peoria	Slope	Steam.	90	4.8	5	"	2	"	45	65	10	3	250	750	1		62½	65	36,000	1 00
Chapman & Little	"	Shaft	"	60	4.6	5	"	2	Fan	25	30	6	2	130	550			62½	62½	11,600	1 05
Peoria Co-op. Coal Co	"	Slope	"	90	4.6	5	"	2	Fur	20	30	5	2	200	950			62½	62½	20,700	1 00
Daily & Barton	Bartonville	"	"	110	4.6	5	"	2	Fan	12	12	3	1	250	350			62½	62½	7,800	1 00
Colliers' Co-op. Coal Co	"	"	"	87	4.6	5	"	2	Fur.	25	24	6	1	256	1,102			62½	62½	25,240	1 12½
John Anderson	"	"	Horse.	40	4.6	5	"	2	"	1	2			200	20			62½	62½	500	1 00
Bogan & Pye	"	"	Steam.	125	4.6	5	"	2	"	3	11	1	1	180	217			62½	62½	3,418	1 12½
George Keller	"	Shaft	Horse.	40	4.6	5	"	2	"	2	6	1		200	60			62½	62½	1,560	1 12½
Walter Treasure	"	Slope	"	77	4.6	5	"	2	"	6	10	2	1	240	140			62½	62½	4,600	1 12½

Millard & Woolslag	Peoria	Drift	"	95	4.6	5	"	2	"	20	40	4	2	280	1,100	..	2	62½	62½	21,000	1 00
F. Smith	"	"	"	90	4.6	5	"	2	"	2	4	1	1	200	100	..	....	62½	62½	2,250	1 00
Edwin Wolland	"	"	"	90	4.6	5	"	2	"	8	15	3	1	250	370	..	....	62½	62½	7,200	1 00
Fender Bros	"	"	Hand	80	4.4	5	"	2	"	4	10	2	....	200	210	..	....	62½	62½	5,800	1 00
James Monroe	"	"	"	160	4.4	5	"	2	"	3	18	....	....	260	180	..	....	62½	62½	8,000	1 00
John Laucks	"	Shaft	Horse	40	4.2	5	"	2	"	4	4	1	....	280	90	..	....	62½	62½	2,340	1 00
James Days	"	Drift	Hand	125	4.4	5	"	2	Nat	2	2	....	....	200	32	..	....	62½	62½	910	1 00
Ed. Allen	"	"	"	125	4.4	5	"	2	"	....	3	....	....	146	20	..	....	62½	62½	290	1 00
E. S. Wilcox	"	Slope	Steam	80	4.2	5	"	2	Fan	25	50	4	2	250	1,000	..	....	70	70	20,000	1 10
Royster Bros. & Co	"	Shaft	"	140	4.2	5	"	2	"	25	40	5	1	260	1,000	.	....	75	75	18,241	1 10
Enterprise Co-op. Coal Co	"	"	"	110	4.2	5	"	2	"	....	14	4	....	160	800	..	....	75	75	16,000	1 00
Star Co-op. Coal Co	"	"	"	175	4.2	5	"	1	"	....	12	3	....	180	200	..	....	75	75	5,260	1 00
Fred Moon	"	"	Horse	40	4.2	5	"	2	Fur	2	4	1	....	220	410	..	....	75	75	1,020	1 00
Daniel Purcell	"	Drift	Hand	80	4.2	5	"	2	"	2	8	....	....	200	125	..	....	75	75	3,000	1 00
Peter Ennis	"	"	"	80	4.2	5	"	2	"	....	2	....	....	100	20	..	....	75	75	350	1 00
Brost Bros	"	"	Horse	140	4.2	5	"	2	"	6	15	1	1	216	200	..	....	75	75	5,296	1 00
Frank Rewart	"	Slope	Steam	100	4.2	5	"	2	"	2	6	1	....	181	90	..	....	62½	62½	2,100	90
Butte & Moon	"	Shaft	Horse	70	4.2	5	"	2	"	2	6	1	....	180	100	..	....	62½	62½	2,764	90
Bennett & Co	"	"	Steam	95	4.2	5	"	1	Jet	....	4	1	....	90	12	..	....	62½	62½	360	90
Michael Duffy	"	Drift	Hand	150	4.2	5	"	2	Fur	1	3	....	....	100	32	..	....	62½	62½	762	1 00
John Birdoes	"	"	"	150	4.2	5	"	2	"	2	3	....	....	120	50	..	....	62½	62½	1,020	1 00
O'Keefe & McMaster	"	"	"	150	4.2	5	"	2	"	1	3	....	....	120	40	..	....	62½	62½	910	87½
Wm. Harraman	"	"	"	150	4.2	5	"	2	"	1	2	....	....	120	30	..	....	62½	62½	710	87½
Thomas Orr	"	"	"	150	4.2	5	"	2	"	1	2	....	....	90	10	..	....	62½	62½	215	87½
M. Duffy	"	"	"	102	4.2	5	"	2	Nat	....	2	....	....	100	12	..	....	75	75	225	1 00
John Nee	"	"	"	120	4.2	5	"	1	"	....	2	....	....	90	15	..	....	75	75	310	1 00
C. Lammas	"	"	"	90	4.2	5	"	2	Fur	....	1	....	....	120	10	..	....	75	75	215	1 00
James Slain	"	"	"	120	4.2	5	"	2	"	2	2	....	....	100	22	..	....	75	75	460	1 00
James Wait	"	"	"	80	4.2	5	"	2	"	1	2	....	....	220	30	..	....	76	75	678	1 00
H. Vickery	"	"	Horse	80	4.2	5	"	2	"	4	9	2	1	190	210	..	....	75	75	2,900	1 00
Mary Ann Potts	Pottstown	"	"	85	4.6	5	"	2	"	4	12	2	1	200	210	..	....	75	75	4,670	1 00
A. Williams	"	"	"	85	4.4	5	"	1	Nat'l	....	2	....	....	124	29	..	....	75	75	560	1 00
Samuel Parker	"	"	"	90	4.6	5	"	2	Fur	2	4	1	1	180	41	..	....	75	75	894	1 00
James Jones	"	"	Hand	90	4.6	5	"	2	"	....	2	....	....	90	15	..	....	75	75	200	1 00
Jesse Stafford	"	"	"	80	4.6	5	"	2	Nat'l	1	1	....	....	150	8	..	....	75	75	180	1 00
James Aberley	"	"	Horse	120	4.6	5	"	2	Fur	6	10	2	1	240	210	..	....	75	75	5,890	1 00
James Cocharn	"	"	"	110	4.6	5	"	2	"	2	2	....	....	210	26	..	....	75	75	460	1 00
Howarth & Wantling	Edwards	"	Steam	95	4.4	5	"	2	"	75	85	15	3	290	2,500	..	....	70	70	45,000	1 00
Burlington Coal Co	"	"	"	82	4.4	5	"	2	"	25	60	13	3	250	1,700	..	1	70	70	34,000	1 00
Kramm Bros	"	"	Horse	85	4.4	5	"	2	"	....	7	1	1	125	70	..	....	70	70	2,000	1 00
Richard Pillman	"	"	Hand	60	4.6	6	"	2	Nat'l	....	2	....	....	60	......	.	....	70	70	200	1 50
Richard Lonsdale	"	"	"	46	4.6	6	"	2	"	....	2	....	....	100	......	..	....	75	75	371	1 25
Wm. Harper	"	"	"	75	4.6	6	"	1	"	....	4	....	....	100	......	..	....	75	75	941	1 25
Wm. Lonsdale	"	"	"	60	4.6	6	"	2	"	....	2	....	....	60	......	..	....	75	75	234	1 25
Charles Kingley	"	"	"	55	4.6	6	"	1	"	1	1	....	....	190	......	..	....	75	75	560	1 25
A. Purtscher	Kramm	"	Horse	74	4.2	5	"	2	Fur	20	45	10	3	280	600	..	....	70	70	11,000	1 15
Rice & Co	Elmwood	Slope	"	56	4.6	6	"	1	Nat'l	....	2	....	....	200	......	..	....	62½	75	450	1 25
J. Proctor	"	Shaft	"	65	4.6	6	"	1	"	....	2	1	....	90	......	..	....	62½	75	500	1 25
Johnston & Co	Brimfield	"	"	30	4.6	6	"	2	Fur	4	6	1	....	124	......	..	....	75	85	964	1 25
James Tully	"	Drift	Hand	75	4.6	6	"	2	"	3	4	1	....	90	......	..	....	75	85	560	1 25
Wm. Hindle	"	"	"	30	4.6	6	"	1	Nat'l	....	2	....	....	124	......	..	....	75	75	300	1 25
G. W. Smith	"	"	"	60	4.6	6	"	2	"	....	2	....	....	130	......	..	....	75	75	311	1 25

Peoria County—*Continued.*

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Bennett & Pemble	Brimfield	Shaft	Horse	40	4.6	6	P. R.	2	Fur.		3	1		110				$0 75	$0 87½	720	$1 25
Wm. Arnolds	"	"	"	50	4.6	6	"	2	"	2	4	1		188				75	87½	1,125	1 25
George Shane	"	Slope	"	50	4.6	6	"	2	Nat'l		4			90				75	75	476	1 25
John Duffy		"	"	45	4.6	6	"	1	"		2			95				87½	87½	240	1 25
Charles Berry	Monica	Shaft	"	60	4.6	6	"	2	Fur.		6	1		160				87½	87½	1,870	1 25
John Hick	Princeville	"	"	35	4	6	"	2	"	2	4	1		125	5			1 00	1 00	1,100	1 75
Hanna City Coal Co.	Hanna	"	Steam.	240	4.4	5	"	2	Fan.	15	35	9	2	150	500			75	75	10,000	1 05
R. P. Downing	Smithfield	Slope	Horse.	50	4.6	6	"	2	Nat		2			120				75	75	571	1 25
Samuel Linchcott	Kickapoo	"	Hand.	75	4.6	6	"	2	"		2			100					75	200	1 25
Edwin Filey	"	"	"	60	4.6	6	"	2	Fur.	2	5		1	131				75	75	1,230	1 25
Jubilee Coal Ce	Jubilee	Drift	"	110	2.6	5	"	2	"		2			110	5				70	80	1 25
Totals	87									545	990	164	49		19,609	1	4			452,123	
Averages														164				$0 6935	$0 6965		$1 04.6

TAZEWELL COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Louis Grant & Sons	Pekin	Shaft	Steam.	120	4.6	5	P. R.	2	Fan	20	30	3	2	135	600		2	$0 75	$0 75	12,000	$1 00
Norman C. Hawley	"	"	"	85	4.6	5	"	2	Fur.	15	27	4	1	190	430			70	70	9,500	1 00
Pekin Coal Association	"	"	"	99	4.4	5	"	2	Jet	2	6	1		215	89			62½	62½	2,020	1 00
Wm. Rundle	"	"	Horse.	132	4.6	5	"	2	Fur.	3	6	1		200	116			70	70	5,890	1 10
August Morritz	"	"	"	100	4.6	5	"	2	"	2	6	1		200	120			75	75	2,600	1 50
Wesley City Coöp. Coal Co	Wesley City	"	Steam	115	4.2	5	"	2	Fan	40	40	7	2	200	1,200			62½	62½	16,017	1 06
Rushia Brothers	Hilton	Slope	Horse.	98	4.4	5	"	2	Fur.	2	8	2	1	180	90			62½	62½	1,620	1 25
Henry Doring	"	Shaft	"	40	4.4	5	"	1	Nat'l.		2	1		140	20			62½	62½	480	1 00
Chamberlain & Workman.	"	"	"	95	4.2	5	"	2	Fur.	2	6	1		210	82			62½	62½	1,480	1 00
Samuel Allen	"	Drift	Hand.	40	4	6	"	2	Nat'l.	1	1			100				62½	62½	240	1 00
Totals										87	132	21	6		2,747		2	$0 68	$0 68	51,847	
Averages														177							$1 06.3

VERMILION COUNTY—THIRD DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd — Summer	Number of miners employ'd — Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining — Summer	Price per ton paid for mining — Winter	No. of tons of coal produced	Average value of coal per ton, at the mine
Consol. C. Co. of St.L. No.1	Danville	Drift	Horse.	45	6	7	P.-R.	2	Fur.	8	10	50	1	187	270	..	....	$0 60	$0 60	16,275	$1 10
" " " No. 2	"	Shaft	Steam	74	6	7	"	2	Fan	100	150	25	8	227	1,296	..	1	60	60	79,437	1 10
" " " No. 3	"	"	"	103	6	7	"	2	"	75	125	25	7	227	1,120	1	1	60	60	67,957	1 10
" " " No. 4	"	"	"	71	6	7	"	2	"	.....	25	10	2	20	14	..	....	60	60	420	1 10
Standburg & Russell	"	"	Horse.	49	5.8	7	"	2	Fur.	3	6	1	....	190	48	..	....	65	65	2,046	1 10
Rose & McKernan	"	"	"	40	6	7	"	2	"	2	.....	1	....	105	10	..	....	60	60	462	1 25
John E. Lloyd	"	Drift	Hand.	60	5.6	7	"	2	"	4	8	1	....	260	100	..	....	60	60	4,868	1 10
Wm. Lewis	"	Slope	Horse.	40	5.8	7	"	2	Nat'l.	2	2	....	....	156	14	..	....	60	60	370	1 25
John E. Davis	"	Shaft	"	40	5.6	7	"	2	"	2	4	1	....	200	15	..	....	65	65	582	1 25
Wm. Hoges	"	Drift	Hand	30	5 10	7	"	1	"	.....	1	....	....	90	8	..	....	65	65	260	1 25
Noah Morgan	"	"	"	40	5.10	7	"	2	Fur	2	4	1	....	215	35	..	....	60	60	2,500	1 25
Wm. Child	"	"	"	40	5.10	7	"	2	"	.....	2	....	....	90	10	..	....	60	60	340	1 25
W. H. Jenkins	"	"	"	35	5.6	7	"	2	Nat'l.	2	3	1	1	240	35	..	....	60	60	1,800	1 25
A. G. Jenkins	"	Slope	Horse.	60	5.8	7	"	2	"	1	3	1	1	280	25	..	....	60	60	1,300	1 25
B. Bensel	"	Drift	Hand.	40	5.6	7	"	2	Fur.	2	4	1	....	200	20	..	....	65	65	1,760	1 12½
Isaac Braceville	"	"	"	70	6.4	6	"	2	"	6	9	2	....	250	159	..	....	60	60	8,000	1 25
Wm. Ray	"	"	"	50	5.6	7	"	2	Nat'l.	2	.....	....	....	60	5	..	....	60	60	210	1 00
Lloyd & Rodda	"	Slope	Horse.	50	5.6	7	"	2	"	.....	4	1	1	120	28	..	....	65	65	968	1 10
Perry Fairchild	"	"	"	65	5.4	7	"	2	Fur.	2	4	1	....	240	20	..	....	60	60	1,500	1 00
John Morbaker	"	Drift	Hand.	60	5.4	7	"	2	Nat'l.	.....	2	....	....	80	5	..	....	50	60	290	1 00
Bolton & Ray	"	"	"	40	5.4	7	"	2	Fur.	4	6	1	....	200	18	..	....	60	60	1,260	1 00
Alfred Lomax	"	"	"	40	5.4	7	"	2	"	2	3	....	....	215	6	..	....	60	60	880	1 00
Grape Cr'k C. & C. Co. No.2	Grape Creek	"	Horse.	60	6.8	6	"	2	"	.....	3	....	1	120	30	..	....	65	65	1,420	1 15
Grape Cr'k C. & C. Co. No.3	"	Shaft	Steam	18	6.8	6	"	2	"	80	100	12	7	200	1,201	..	2	65	65	23,200	1 15
Grape Cr'k C. & C. Co. No.4	"	Drift	Horse.	70	6.6	6	"	2	"	12	12	2	2	200	61	..	....	65	65	12,000	1 15
Grape Cr'k C. & C. Co. No.5	"	Shaft	Steam	125	6.8	6	"	2	Fan	100	120	75	8	209	1,325	..	5	65	65	45,700	1 15
Michael Kelly	"	"	"	95	6.8	6	"	2	"	70	90	19	5	136	1,050	..	2	65	65	34,000	1 10
T. L. Spellman	"	Drift	Horse.	60	6.6	6	"	2	Fur.	20	35	4	2	140	125	..	1	65	65	9,500	1 20

Charles Moran	Grape Creek	Drift	Horse	60	6.8	6	P.-R.	2	Nat'l.	5	8	3	1	270	40			70	80	1,600	1 25
H. Parrish	"	"	"	70	6.6	6	"	2	"	2	4	1		236	31			70	80	860	1 25
Buntling Bros	"	"	"	100	6.6	6	"	2	Fur.	3	3			180	25			70	80	688	1 25
John Riley	"	"	"	80	6.4	6	"	2	Nat.	2	4			209	20			70	70	579	1 25
Crutchley & Co	Catlin	Shaft	"	60	6	7	"	2	Fur.	3	6	1		200	36			60	60	1,190	1 25
Thomas Thomas	"	Slope	"	130	6	7	"	2	"	2	2	1		256	15			55	60	750	1 00
France Bros	Fairmount	Shaft	"	103	6	7	"	2	"	6	8	1		286	200			75	75	3,860	1 25
George Emmett	"	"	"	98	6	7	"	2	"	4	6	1		200	45			70	75	2,350	1 25
John Woodard	"	"	"	51	6	7	"	2	"	2	4	1		180	37			70	75	1,426	1 25
Woodaard Bros	Oakwood	"	"	40	6	7	"	2	"	2	4	1		210	48			60	60	1,600	1 00
James Woodard	"	"	"	45	6	7	"	1	Nat.	2	2	1		124	20			60	60	670	1 00
Thomas Spankler & Co.	Hillier	"	"	50	6	7	"	1	"	2	2	1		100	12			65	65	436	1 25
S. H. Swallow	Glenburn	"	Steam.	120	6	7	"	2	Fan	15	13	4	1	125	180			60	60	3,200	1 25
Samuel Swisher	Blount	"	Horse.	95	6	7	"	2	Fur.	8	14	3		214	75			65	65	3,100	1 25
T. Phillips	"	"	"	110	6	7	"	2	"	8	12	3		200	100			60	60	3,000	1 25
G. A. Crawford	Georgetown	Slope	"	50	5	7	"	1	Nat'l.	2	3			175	10			75	75	560	1 25
N. Neely	Oakwood	"	"	100	6	7	"	2	"	2	2			190	15			75	75	380	1 25
Joseph McBroom	"	Strip		12	6	7					20			*a* 100				60	60	5,000	1 00
W. J. Reily	Danville	"		7	6	7					8			*a* 120					60	2,300	1 00
A. S. Willi ms.	"	"		10	6.6	7					12			*a* 96					60	3,468	90
Wm. Kelly	"	"		12	6.6	7					4			*a* 75					60	870	90
John Brady	Vandercook	"		12	6.6	7					2			*a* 50					50	360	80
John McBride	"	"		10	6.6	7					4			*a* 36					50	467	87½
Isaac Wolf	Catlin	"		14	6.6	7					6			*a* 50					60	600	1 00
John Stafford	"	"		11	6.6	7					1			*a* 60					60	180	1 00
David Lewis	"	"		12	6.6	7					2			*a* 70					60	410	1 00
Totals										571	891	257	48		7,962	1	12			359,119	
Averages														182				0 62.25	0 62.40		$1 12½

WOODFORD COUNTY—THIRD DISTRICT—1887.

Chicago and Minonk Coal and Coke Co	Minonk	Shaft	Steam.	550	2.6	2	L. W.	2	Fan	180	240	100	17	300	50	1	9	$0 85	$0 85	100,009	$1 25
Roanoke Mining Co	Roanoke	"	"	480	2.4	2	"	2	"	35	50	13	3	240	10		2	85	85	22,445	1 35
Totals										215	290	113	20		60	1	11			122,445	
Averages														270				$0 85	$0 85		$1 26.8

a These days not included in computing average working time for mines.

RECAPITULATION BY COUNTIES—THIRD DISTRICT—1887.

Counties.	No. of mines	No. of mines shipping coal	No. of mines in local trade	Kinds of power employed			Kinds of openings.			Modes of working coal.				No. of miners and other employés.			Average No. of days worked	No. of mules under ground	No. of kegs of powder used	No. of men killed	No. of men injured so as to lose time	Average price per ton paid for mining.		No. of tons of coal produced	Average price of coal per ton at the mines	No. of mines with escapement shafts	No. of mines without escapement shafts	Kinds of power used for ventilation.			
				Steam	Horse	Hand	Shaft	Slope	Drift	Pillar and room	Long wall	Single entry	Double entry	Miners, summer	Miners, winter	Other employés						Summer	Winter					Fan	Furnace	Steam jet	Natural
Cass	4	1	3	1	3		4			3	1	3	1	8	14	2	166		24			$0 95	$0 95	2,325	$1 39.9	4				1	3
Fulton	73	21	52	14	27	32	24	12	37	73		43	30	477	819	134	166	53	10,714		2	69.07	73.3	337,215	1 06.9	57	16	9	34		30
Logan	3	3		3			3			3			3	160	235	71	260	19	4,766		2	62.1	62.1	159,000	1 14.3	3		3			
McLean	2	2		2			2				2			200	336	94	233	9	50	2	4	70	81.5	141,700	1 23.5	1	1	1		1	
Menard	10	6	4	6	4		10			10		2	8	125	284	56	221	22	5,781		3	59.8	60.8	155,621	96.7	8	2	3	6		1
Peoria	87	26	61	19	35	33	18	21	48	86	1	35	52	545	990	164	164	49	19,609	1	4	69.35	69.65	452,123	1 04.6	77	10	8	56	1	22
Tazewell	10	3	7	4	5	1	8	1	1	10		6	4	87	132	21	177	6	2,747		2	68	68	51,847	1 06.3	9	1	2	5	1	2
Vermilion	45	13	32	7	27	11	19	7	19	45		11	34	571	891	257	182	48	7,962	1	12	62.25	65.40	359,119	1 12.5	41	4	6	24		15
Woodford	2	2		2			2				2		2	215	290	113	270	20	60	1	11	85	85	122,445	1 26.8	2		2			
Totals	236	77	159	58	101	77	90	41	105	230	6	100	136	2,388	3,991	912		226	51,713	5	40			*a*1,781,395		202	34	34	125	4	73
Averages																	204					$0 67.52	$0 69.42		$1 09.5						

a 360 tons not included in averaging prices for mining.

Number of new mines opened, ... 37
Number of mines permanently abandoned..................... 25

JAMES FREER, *State Mine Inspector*,
Peoria.

FOURTH DISTRICT.

MR. JOHN S. LORD,

Secretary of the State Bureau of Labor Statistics, Springfield, Ill.

In compliance with the law definining the duties of the inspectors of mines, I herewith submit my annual report for the year ending July 1, 1887, embracing statistics of the character and production of all the mines in the Fourth inspection district, comprising the counties of Bond, Calhoun, Christian, Coles, Edgar, Greene, Jasper, Jersey, Macon, Macoupin, Madison, Morgan, Montgomery, Sangamon, Scott and Shelby.

The records of the coal trade for the fiscal year show a large falling off of the output in tonnage for the counties of Madison and Macoupin. This is due principally to the stoppage of a number of mines on the Vandalia and Terre Haute, the Wabash and St. Louis and the Indianapolis and St. Louis Railroads. At the beginning of the fiscal year the Consolidated Coal Company of St. Louis became the owners of nearly all of the mines operated on the above roads, and finding a large surplus of mines over and above the demands of the coal trade, decided to operate only those mines where coal could be mined at a minimum price, and to do most of the work by coal-cutting machinery. Four mines were stopped on the Vandalia and Terre Haute, four on the Wabash and St. Louis, and one on the Indianapolis and St. Louis railroads, and two of the largest mines on the Wabash have been stopped for a period of three months for the purpose of putting in a plant to mine the coal by machinery. However, in presenting to you this report, it affords me pleasure to state that the record of improvements in the mines during the past year has kept pace with that of the preceding years, all the mines shipping coal (with the exception of one or two) have adopted the system of fan ventilation, working of the coal by double entries, and the splitting of the air currents. Wherever it is found possible, overcasts are put in for the purpose of carrying the return air over the intake, with suitable regulators for the purpose of regulating the quantity in each split; the timbering in the mines is made more substantial, and set with a special view to safety on the hauling roads; the air is carried more directly to the face of the working places; more attention is paid to the ropes and cages, and most of the large mines are adopting steel ropes; the mine managers are generally taking more interest in the mining law and are working with a view to the safety of the men, and the most economical extraction of the coal. The large operators are generally adopting machinery for the mining of the coal where the coal seam is suitable for it.

During the year the Consolidated Coal Co. has put in a machinery plant at three of their largest mines, viz: No. 6 Staunton, No. 8 Mount Olive, and Gillespie shaft at Gillespie. The Pana Coal Co. has put in an extensive machine plant during the year, also the Wilmington and Springfield Coal Co. at Ridgely, which will make eleven machine mines in the district. One machine mine, the Confidence at Collinsville has been abandoned.

There are fifty-eight shipping mines in the district; fifty-five are ventilated by fans, and fifty-four are worked by double entry. Tabulated statements are given for each county with a list of fatal and other accidents which have occurred in and about the mines of the district, and their relation to the number of tons mined, and the number of men employed, with a recapitulation sheet for the whole district. The following is a detailed list of fatal casualties during the year ending July 1, 1887.

✓ Smithsboro Coal and Mining Co., Smithsboro, Henry Crossman, a married man aged 25 years, was killed July 26, 1886, by a mule. He was driving down a slight grade, and it was supposed the mule ran away with him. He was found dead at the entrance of a room his head having been crushed against a rock building.

✓ Consolidated Coal Co., shaft No. 6, Staunton, Oscar Vappler, a single man aged 22 years, was killed October 4, 1886, by falling slate in the face of his room.

Consolidated Coal Co., shaft No. 6, Staunton, Frank Poss, a married man aged 43 years, was killed on January 20, 1887, by falling top coal. He was undermining a standing shot.

The following is a list of non-fatal casualties.

CONSOLIDATED COAL CO.

At shaft No. 8, Mount Olive, Charles Dochring, a single man, aged 21 years, had his leg broken by a fall of slate, September 1, 1886.

At the Abbey mine No. 3, Collinsville, Louis Rechner, a single man aged 30 years, had his hand bruised by a fall of slate, September 9. 1886.

At shaft No. 8, Mount Olive, Henry Hackman, a married man, aged 50 years, was bruised on the back and hips by a fall of slate, September 18, 1886.

At shaft No. 6, Staunton, Fritz Willberg, a married man, aged 28 years, was bruised on the back by falling top coal, September 20, 1886. He recovered and returned to work, but afterward was taken sick and died.

Heintz Bluff Mine, Collinsville, Louis Herdmerich, a single man aged 19, had his arm broken by a mule, September 27, 1886.

Abbey Mine No. 3, Collinsville, Charles Lankhe, a married man aged 35 years, had his foot bruised by falling coal, November 19, 1886.

At the Abbey Mine, No. 3, Collinsville, Chris. Amacher, a single man aged 25 years, was bruised on the hips, November 19, 1886, by being caught between two coal cars.

Heintz Bluff Mine, Collinsville, Norman Watson, a married man, aged 40 years, was injured in the back, November 30, 1886, by a fall of slate.

Heintz Bluff Mine, Collinsville, Mike Pears, a single man, aged 30 years, was cut in the head, November 30, 1886, by a fall of slate.

At the Collinsville Shaft, Collinsville, August Ludwig, a single man, had his hand mashed by a fall of coal, January 9, 1887.

At the Collinsville Shaft, Collinsville, John Fahr, Sr., a married man, aged 47 years, had his arm bruised between railroad cars, January 28, 1887. It was afterwards amputated.

Troy Mine, Troy, James Glenitz, a single man aged 50 years, had two ribs broken, March 1, 1887, by a loaded coal car.

At Gillespie Mine, Gillespie, Joseph Sauersavitch, a single man, aged 33 years, had his arm broken, April 22, 1887, by a fall of coal.

Abbey Mine No. 3, Collinsville, Lughi Farina, a married man, aged 33 years, was injured in the back by a fall of slate, May 3, 1887.

At Heintz Bluff, Collinsville, Gotlieb Kenzle, a single man, aged 40 years, was bruised on the head by a fall of coal, May 30, 1887.

Shaft No. 6, Staunton, Julius Sheibe, a married man, aged 33 years, had six ribs broken, February 11, 1887, by falling slate in the face of entry.

At Shaft No. 6, Staunton, Ernest Helm, a married man, aged 42 years, was injured by falling coal in the face of entry, February 11, 1887.

Bunker Hill Coal Co.

Henry Sherlock, a single man, aged 21 years was injured on the head and back by falling slate in the face of entry, January 13, 1887.

January 21, 1887, Matt Carroll, a married man, aged 55 years, was injured on the head by a fall of slate in the face of his room.

City Coal Co.

At Niantic, M. Sweet a married man, aged 48 years, was injured by a fall of slate, in November, 1886, in the face of his room. He lost 35 days work.

Pana Coal Co.

J. J. Huges, a married man, was injured on the leg in November, 1886, by a fall of coal. He lost about four months' work.

John Korcham, a single man, had his arm broken by a prop, in November, 1886, and is not yet able to work.

DECATUR COAL CO.

John Graham, a married man, aged 65 years, was injured by a fall of coal, October 16, 1886, and lost six weeks' work.

John Bagenski, a married man aged 40 years, was injured in the back and legs, February 5, 1887, by falling slate. He did not resume work again.

Wm. Northoff, a single man aged 24 years, was injured in the back, February 7, 1887, by falling coal, and did not return to work.

GIRARD COAL CO.

John Carry, a married man aged 45 years, was injured on the foot by a fall of slate.

Nicholas Cahill, a single man aged 23 years, had his foot crushed by a loaded box.

Fred. Ernst, a single man aged 40 years, was hurt on the shoulders by a fall of coal.

M. Curtis, a married men aged 40 years, had his foot hurt by a fall of coal.

BARCLAY COAL CO.

Frank Schlett, a single man aged 24 years, had his leg broken by the cage, December 4, 1886. He was cager at the shaft, and the cage had been taken away from the bottom for the purpose of loading the upper cage at the lower landing with timber. He had gone into the cage chamber to clean off the sump planks, and through some mistake the cage was lowered upon him. He lost four months' work.

Daniel Freeman, a married man aged 58 years, was injured October 5, 1886, by a blast. He was in the act of drilling out a hole that had missed fire, the drill struck sulphur, igniting the powder, burning him very severely and injuring his eyes to such an extent that he has not been able to work since.

J. W. MOORE & CO., SPRINGFIELD.

Wm. L. Gerkin was injured on June 16, 1887, by a mule. He was driving the animal when it ran away with him hurting his head.

WILMINGTON AND SPRINGFIELD COAL CO., RIDGELY.

Mike McCarty, a married man aged 30 years, was injured January 25, 1887, by falling slate. He was a loader after the machines, and had been loading coal in the room; the timber man had brought in props to timber the place, but while McCarty was helping to unload the timber the slate fell cutting and bruising him. No bones were broken, but he is still idle.

SANGAMON COAL CO. SHAFT NO. 1, SPRINGFIELD.

Michael Lynch, a married man aged 45 years, was injured January 5, 1887, by falling off the cage.

WABASH COAL CO., DAWSON.

James Simpson, a single man aged 17 years, was injured in January, 1887, by falling under the cars while they were in motion. His leg was broken.

Robert Smith, aged 45 years, John C. Smith, aged 21 years, Thomas Smith, aged 19 years, Robert Smith, aged 17 years, and J. W. Smith, aged 24 years, were injured May 4, 1887, by an explosion of powder. It appears that the father, Robert Smith, was dividing parts of two kegs of powder with his sons and nephews, when from some cause, either from the lamps or tobacco pipes, the powder became ignited, burning them all severely. Some of them are still unable to resume work.

The following is a statement of the number of employés, (based on mining in winter), the number of tons of coal produced, the number of casualties fatal and non-fatal, with the ratio of the number of tons of coal produced, and the number of persons employed for each fatal and non-fatal accident for this district for the year ending July 1, 1887:

Number of employés, miners	3,861
Other employés in and around the mines	1,056
Total number of employés	4,917
Number of tons of coal produced	2,565,791
Number of casualties, fatal	3
Number of casualties, non-fatal	40
Total number of casualties	43
Number of employés to each fatal casualty	1,639
Number of employés to each non-fatal casualty	123
Number of tons produced for each fatal casualty	855,263
Number of tons produced for each non-fatal casualty	64,145

There have been 3 fatal and 40 non-fatal accidents in the district during the year. About 75 per cent. of the accidents is caused by falling of coal and slate in the working places of the miners. Under our system of working the employés are made responsible for their own safety in the face of the working places, it being generally considered that the miner should know more about the nature and condition of the roof and coal which he is working under than any other person in the mine. Timber is furnished by the mine manager when asked for. The general cause of such accidents is under-mining what are termed standing shots. When there is a rush of work proping and timbering are also sometimes neglected, and our seams of coal being from 6 to 8 feet in thickness, the best of judgment will sometimes fail as regards the solidity of the coal face. Sometimes the coal has been blasted over the under-mining, then in unde-rmining again, large quantities of it fall. From this cause most of the accidents come in machine mining. A bad system prevails at some collieries of loading two cars at a time in the face of the room or working place, and props are left out so as to get around the cars with the coal. Slips and partings sometimes occur in the coal and slate which are very deceptive, as they cannot at all times be seen by the miner.

Accidents in coal mines will occur as long as mining is done, but to reduce those accidents to a minimum, it is necessary to have an intelligent mine manager, who will see that the working faces are visited at least twice a day, the roof and coal face carefully examined, and instructions given to the employés as regards the conditions of the same. Chalk marks should be made where props are required to be set, and the manager should see that they are put up; and in under-mining he should instruct the miner in the use of blocking as the mining progresses. No under-mining should be allowed under standing shots, and the miner should be permitted to load only one car at a time. The manager should instruct the miners to be careful in the handling of powder, as they are responsible for it after it leaves the powder house and is taken into the mine. He should see that the powder is kept in a box with a cover on it; the miner should be instructed not to make a cartridge with a lamp on his head, nor with his pipe in his mouth, nor should he set his lamp on the powder box. No blasts that have missed fire should be again drilled out, and all miners should use copper tools, as the law directs. When a shot has been fired the miner should be urged to use great care, not to be too hasty in going back to it, and to carefully examine the roof and coal and see that both are in a safe condition before he goes to work under them. At all collieries a set of rules and instructions ought to be drawn up by the superintendent or mine manager, for the instruction and guidance of the employés. Some of the collieries in this district have such rules, and I find as a general thing accidents are less frequent at these mines. Efficient colliery management not only decreases the risk of accidents to employés, and to the mine itself, but must always result in effecting the most economical extraction and preparation of the coal.

The mine manager should be provided with an anemometer, thermometer, and water guage; the anemometer to be used in measuring the total quantity of the air in the intakes and returns, and to each split; the thermometer to give the temperature of the mine and the gob in old workings, for whenever the temperature of the gob in old workings approaches 90 degrees of heat, fire generally breaks out. I am happy, however, to state that since the introduction of double entries, and improved systems of ventilation, by splitting the air and the use of fans, the quantity of air has been so increased that gob fires have been reduced to a minimum. The water guage is to be put in the fan chamber, to show the mine manager the drag of the mine, and the condition of the airways.

The following is a list of new mines opened during the year:

Jacksonville Coal and Mfg. Co	Jacksonville.
Thompson's Mine	Bethel.
John Kelley & Sons	Edwardsville.
Wm. Owens	Moro.
Cogger & Co	Chesterville.
Eliga Tutal	Robinson Creek.
Henson & Daughbald	" "
Andy Wade	Fancher.

The following is a list of mines abandoned during the year:

Farroll & Loomis	Carlinville.
Thos. Watson	North Alton.
Henry Camp	" "
Edward Jones	Moro.
Farmers' Coal Co	Neelyville.
John Galloway	Pleasant Plains.
Marsh & Patent	Piasa.

In section 12 of the mining law the inspectors are required to recommend such further legislation as may be deemed necessary, or such changes as may be required for the better police regulation of the mines.

In compliance with the above section, I would most respectfully recommend that the General Assembly, at the next session, make such addition to the mining code as shall compel all mine managers, in charge of mines wherein 10 or more men are employed, to obtain certificates of competency or of service from an authorized board, consisting of equal numbers of operators and miners; a certificate of service to be given to mine managers who have been employed by the same company for a specified time, but such manager shall not be employed by any other company unless said manager has obtained a certificate of competency.

In reviewing the mining of the past, such legislation has been found necessary, as it is important that mine managers should have knowledge of both the technical and practical part of mining, as conducive to the safety of those under them, and the more economical management of the mines. Such addition to the mining code would add great interest to the cause of education among the miners of the State, mining schools would spring up in the various mining villages, where the industrious and intelligent miners could pass their leisure hours in study, preparing themselves for such examinations.

The relationship between operators and miners has been generally harmonious during the year. No stoppage of any kind has occurred in this district, though some few minor troubles have occurred which were speedily adjusted by the officers of the State Miners Protective Association. It was generally conceded that on the 1st of May, 1887, an advance in the price of mining would be made, according to the Columbus scale of prices, adopted by the National Federation of Miners and Mine Laborers, but after a thorough discussion of the state of the coal trade in meetings held at Chicago and other points, it was agreed that mining should be done at last year's prices. In the counties of Madison, Macoupin and Christian, the machine miners are paid by the day, on a basis of 50 cents per ton for hand mining in the same counties.

In taking a prospective view of the condition of the coal trade in this district, the outlook is very flattering for a larger output and a better system of mining. The larger mines being now nearly all consolidated, the trade will branch out, and coal depots will be established at all points where coal can be sold at a small margin. The smaller mines in the district will gradually be abandoned, being unable to compete with organized capital, and a number of the old mines in the district which are now shipping coal will shut down, owing to the expense of operating them. The new mines, with improved plant and facilities for handling coal cheap, will be operated extensively. All work in and around the mines will be systematized, and the dead-work expenses reduced to a minimum; proper surveys of the mines will be kept, and none but competent men will be employed as managers. The mines will be kept in safer and more healthful condition, as all supplies will be furnished promptly on the necessary requisition of the mine manager. The employés will also obtain a better price for their labor, as three-fourths of the competition in the coal trade in this district will be cut off, and wages will be steady.

Respectfully submitted,
WALTON RUTLEDGE,
Inspector Fourth District.
Alton.

BOND COUNTY—FOURTH DISTRICT—1887.

Name of firm, company, or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton, at the mine
										Summer	Winter							Summer	Winter		
a Smithsboro Coal and Mining Co.	Smithsboro	Shaft	Steam.	472	5	6	P. R.	1	Fan	20	28	9	2	250	650	1		$0 50	$0 60	18,000	$1 00
Sorrento Coal Co.	Sorrento	"	"	373	7.6	6	"	2	"	20	30	7		250	420			50	50	18,076	1 00
Totals										40	58	16	2		1,070	1				36,076	
Averages														250				$0 50	$0 55		$1 00

a Sinking escapement.

CALHOUN COUNTY—FOURTH DISTRICT—1887.

a Thomas Mines	Brussels	Slope	Horse		2.6	1	P. R.	2	Fan												

a Not operated during the year.

CHRISTIAN COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Products.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room-workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
[a] Pana Coal Mining Co.	Pana	Shaft	Steam.	704	7.6	6	P. R.	[c] 1	Fan.	85	130	36	7	293	661		2	[b]		149,973	$0 83
Totals										85	130	36	7		661		2			149,973	
Averages														293							$0 83

a Coal mined by Harrison machines.
b Men paid by the day. *c* Escapement shaft now down 450 feet.

COLES COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room-workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Miners employ'd, Summer	Miners employ'd, Winter	No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton, Summer	Price per ton, Winter	No. of tons of coal produced	Average value of coal per ton at the mine
[a] Mattoon Mining Co.	Mattoon	Shaft	Steam.	904	3.6	2	L.W.	1	Fan.	75	100	24	5	260				$0 75	$0 75	34,612	$1 50
Totals										75	100	24	5							34,612	
Averages														260				$0 75	$0 75		$1 50

a Escapement shaft now down 320 feet.

EDGAR COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room-workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
a Black Diamond Coal Co	Illiana	Shaft	Steam.	160	4	5	P. R.	2	Fan	...	...	...	...	...	...	...	...	...	...	...	...

a Not operated during the year.

GREENE COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room-workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd—Summer	Number of miners employ'd—Winter	No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining—Summer	Price per ton paid for mining—Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Thos. Carter *a*	Roodhouse	Shaft	Horse	26	...	..	P. R.	2	Fur.	3	6	1	...	218	...	..	...	$0 75	$0 75	2,226	$1 50
Campbell Bros. *a*	"	"	"	26	...	..	"	2	"	4	5	1	...	110	...	..	...	75	75	1,242	1 50
Robert Saint	"	Drift	Hand	...	2.4	1	"	2	"	4	6	1	...	216	...	..	...	75	75	1,200	1 50
Benjamin Israel	"	"	"	...	2.4	1	"	2	"	2	5	1	...	154	...	..	...	75	75	922	1 50
Joseph Smith	"	"	"	...	2.4	1	"	2	"	4	6	1	...	147	...	..	...	75	75	900	1 50
John Griffie	"	"	"	...	2.4	1	"	2	"	5	8	1	...	210	...	..	...	75	75	1,502	1 50
White Hall Co'l and Tile Co	Whitehall	Shaft	Horse	40	2.4	1	"	2	"	10	12	2	...	210	...	.	...	75	75	3,148	1 50
George Newton	"	Drift	Hand	...	2.4	1	"	2	"	2	5	1	...	196	...	..	...	75	75	918	1 50
Wm. Carrolton	"	"	"	...	2.4	1	"	2	"	2	2	1	...	143	...	..	...	75	75	520	1 50
Totals	...	...	...	...	...	..	...	..	...	36	55	10	...	...	...	..	...	...	...	12,578	...
Averages	...	...	...	...	...	..	...	..	...	...	...	...	...	178	...	..	...	$0 75	$0 75	...	$1 50

a Working on pocket coal.

JASPER COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd, Summer	Number of miners employ'd, Winter	No. of other employés, in and about the mine	No. of mules employed underground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining, Summer	Price per ton paid for mining, Winter	No. of tons of coal produced	Average value of coal per ton at the mine
* F. Nigh	Newton	Slope	Horse	90	3	15	P. R.	2	Fur.												

a Not worked during the year.

JERSEY COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd, Summer	Number of miners employ'd, Winter	No. of other employés, in and about the mine	No. of mules employed underground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining, Summer	Price per ton paid for mining, Winter	No. of tons of coal produced	Average value of coal per ton at the mine
John Benson	Brighton	Slope	Hand		3.6	6	P. R.	2	Fur	2	3			200				$1 00	$1 00	812	$1 75
Michael Burns	"	Drift	"		3.6	6	"	2	"	2	2			210				1 00	1 00	622	1 75
Edward Fitzsimmons	"	"	"		3.6	6	"	2	"	2	2			190				1 00	1 00	418	1 75
Thomas O. Day	"	"	"		3.6	6	"	2	"	2	2			200				1 00	1 00	524	1 75
Levi Springer	"	"	"		3.6	6	"	2	"	2	2			160				1 00	1 00	308	1 75
Totals										10	11									2,684	
Averages														192				$1 00	$1 00		$1 75

MACON COUNTY—FOURTH DISTRICT—1887.

		CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft.........	Steam, horse or hand-power, ...	Depth of coal below the surface—feet..........	Thickness of coal—feet and and inches	Geological No. of seam....	Long-wall, or pillar and room workings..........	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about the mine.........	No. of mules employed underground..........	No, of days worked during the year	No. of kegs of powder used during the year..........	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine..........
										Summer	Winter..........							Summer	Winter		
Decatur Coal Co' S. No. 1.	Decatur	Shaft..	Steam.	612	4.4	5	L.W.	2	Fan .	92	125	26	8	311	......	..	1	$0 70	$0 70	47,832	$1 30
" " " 2.	"	"	"	610	4.4	5	"	2	"	57	100	25	5	315	......	..	2	70	70	52,851	1 30
a City Coal Co	Niantic	"	"	370	5.6	5	P. R.	2	"	20	35	10	2	220	900	..	1	67½	67½	17,500	1 12½
Totals	....	....	....	....	....	..	......	..	......	169	260	61	15	......	900	..	4	......	......	118,183	......
Averages	....	....	....	....	....	..	......	..	......	....	.....	....	....	282	......	..	....	$0 69.6	$0 69.6	....	$1 27.4

a Operated by the City Coal Co., of Decatur.

MACOUPIN COUNTY—FOURTH DISTRICT—1887.

		CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Consoli'd Coal Co., S. No.5.	Staunton	Shaft	Steam.	325	7.0	6	P. R.	2	Fan	125	150	35	10	205	808			$0 50	$0 50	96,387	$0 75
" " No.6.	"	"	"	322	7.0	6	"	2	"	150	175	45	11	277	1,591	2	3	50	50	137,636	75
" " No.7.	"	"	"	360	7.6	6	"	2	"	32	32	28	2	275	513			*a*	*a*	53,082	75
" " No. 8.	Mt. Olive	"	"	402	8.0	6	"	2	"	116	127	26	6	164	468		2	50	50	87,702	75
" " No.9.	"	"	"	416	8.0	6	"	2	"											*b*	
" " No.10	"	"	"	420	8.0	6	"	2	"	155	180	35	10	197	618			50	50	134,168	75
Consolidated Coal Co. Anchor shaft.	"	"	"	382	7.6	6	"	2	"	14	14	7	1	150	123			*a*	*a*	10,456	75
Consolidated Coal Co., Dorsey shaft	Gillespie	"	"	346	7.6	16	"	2	"		50	8	2	*f* 82	509			50	50	17,919	75
Consolidated Coal Co., Gillespie shaft	"	"	"	345	7.6	6	"	2	"	72	72	25	6	208	599		1	*a*	*a*	60,665	75
Consolidated Coal Co., Clyde shaft	Clyde	"	"	390	7.6	6	"	2	"	54	54	30	6	176	506			*a*	*a*	53,069	75
Bunker Hill Coal Co	Bunker Hill	"	"	250	5.6	6	"	2	"	40	50	8	2	300	900		2	60	60	27,200	1 00
Farroll & Loomis, No. 1	Carlinville	"	"	280	6.6	6	"	2	"	25	50	10	2	300	360			50	50	25,000	1 00
" " No. 2 (*c*)	"	"	"	286	6.6	6	"	2	"												
Wm. Bartels	"	"	"	230	6.6	6	"	2	Fur	4	12	3		263	83			62½	62½	4,880	1 25
D. Noonan	Nilwood	"	"	325	6.8	6	"	2	Fan	40	52	9	4	260	625			50	50	42,228	1 00
Girard Coal Co	Girard	"	"	357	7.0	6	"	2	"	125	175	40	9	260	3,500		4	50	50	129,502	85
J. W. Utt	Virden	"	"	320	7.0	6	"	2	"	30	60	15	5	275	655			50	50	35,000	1 00

Chesterfield Coal and Mining Co. *d*	Chesterfield	Shaft	Steam.	240	2.10	1	L. W.	1	Jet	.....	.....	....	....	......	......	..	....	......	......	....	......
Davis Bros	Fayette	‘‘	Horse.	40	6.0	6	P. R.	2	Fur	2	4	1	....	250	......	..	....	87½	87½	2,410	1 50
Beilby & Co	Chesterfield	‘‘	‘‘	60	6.0	6	‘‘	2	‘‘	2	3	1	....	220	......	..	....	87½	87½	2,000	1 50
e Cogger & Co	‘‘	‘‘	‘‘	40	6.0	6	‘‘	2	‘‘	2	5	1	....	300	......	..	....	87½	87½	2,314	1 50
Raynor & Lock	Bunker Hill	‘‘	‘‘	150	5.6	6	‘‘	2	‘‘	6	12	1	....	300	......	..	....	75	75	4,970	1 25
Totals	......	......	......	....	....	..	......	..	......	994	1,277	328	76	......	11,858	2	12	......	......	926,588	......
Averages	......	......	......	....	....	..	......	..	......	.....	.....	....	....	243	......	..	....	*g* 50.94	50.94	....	80.96

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a Miners paid by the day.

b Output included in mine No. 10.

c Returns included in No. 1.

d Closed by inspector for want of escapement shaft.

e New shaft.

f Not included in average of days. Suspended during summer.

g Average price of mining per ton based on 749,316 tons.

MADISON COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Consol. C. Co. Abbey No. 3	Collinsville	Shaft	Steam	146	6.8	6	P. R.	2	Fan	99	99	47	9	252	1,129	..	4	*a*	*a*	151,579	$0 75
e " Collinsville shaft	"	"	"	150	6.8	6	"	2	"	.....	54	16	6	116	355	..	2	$0 50	$0 50	30,802	75
b " Lumaghi's shaft	"	"	"	165	6.8	6	"	2	Fur	.....	.....	.....	....	.....	.....	..	....	.....	.....	7,220	.....
" Heintz Bluff shaft	"	"	"	168	6.8	6	"	2	Fan	77	77	29	7	217	789	..	4	*a*	*a*	91,046	75
c " Canteen shaft	"	"	"	177	6.8	6	"	2	"	.....	.....	.....	....	.....	.....	..	....	.....	.....	11,020	.....
d " Confidence shaft	"	"	"	216	6.8	6	"	2	"	.....	.....	.....	....	.....	.....	..	....	.....	.....	9,018	.....
" Troy shaft	Troy	"	"	278	5.0	7	"	2	"	42	42	21	4	175	317	..	1	*a*	*a*	32,843	75
e " Worden No. 11	Worden	"	"	278	6.8	6	"	2	"	.....	40	10	3	194	279	..	....	50	50	23,811	75
f " Worden No. 12	"	"	"	280	6.8	6	"	2	"	.....	.....	.....	....	.....	.....	..	....	.....	.....	.....	.....
g " McDonald shaft	"	"	"	300	6.8	6	"	2	"	45	30	8	3	160	200	..	....	50	50	16,220	85
g Brookside C. and M. Co.	Troy	"	"	298	5.0	7	"	2	"	40	60	16	3	156	240	..	....	50	50	37,440	1 00
Wolf Bros. C. and M. Co.	Edwardsville	"	"	217	5.6	6	"	2	"	55	90	9	4	235	575	..	....	50	62½	57,600	90
P. Wonderly & Co	"	"	"	148	5.6	6	"	2	"	20	30	3	3	260	250	..	....	50	50	14,165	85
h John Kelly & Sons	"	"	Horse	110	5.6	6	"	2	Fur	4	8	1	....	300	50	..	....	50	50	5,420	1 00
Alton Stone-ware and Fire Brick Co	Alton	Slope	"	40	2.4	1	"	2	"	4	12	1	1	200	.....	..	....	1 00	1 00	1,402	1 50
Nathan Sydell & Sons	North Alton	Shaft	"	87	2.6	1	"	2	"	4	8	1	....	150	.....	..	....	1 00	1 00	1,610	1 50
James Mitchell	"	"	"	93	2.6	1	"	2	"	8	10	1	....	240	.....	..	....	1 00	1 00	4,110	1 50
Conlin & Co	"	"	"	82	2.6	1	"	2	"	6	12	1	....	200	.....	..	....	1 00	1 00	3,618	1 50
i Baker Bros	"	"	"	72	2.6	1	"	1	Nat'l	.....	4	1	....	150	.....	..	....	1 00	1 00	1,040	1 50
John Pierce	"	Slope	"	25	2.6	1	"	2	Fur	.....	4	1	....	100	.....	..	....	1 00	1 00	620	1 50
j Wm. Chanelsworth	Fosterburg	Shaft	"	60	4.6	6	"	1	Nat'l	.....	4	1	....	200	.....	..	....	75	75	714	1 50
Fritz Ramis	"	"	"	60	4.6	6	"	2	Fur	.....	5	1	....	180	.....	..	....	75	75	625	1 50
P. Meyers	Bethalto	"	"	48	5.0	6	"	2	"	4	8	1	....	300	.....	..	....	75	75	4,400	1 50
H. Meyers	"	"	"	48	5.0	6	"	2	"	4	10	1	....	310	.....	..	....	75	75	4,520	1 50

Wilkinning & Green	Moro	"	"	60	5.0	6	"	2	"	2	4	1		300				75	75	2,500	1 50
Green & Monahan	"	"	"	40	5.0	6	"	2	"	2	5	1		290				75	75	2,428	1 50
Wm. Richardson	"	"	"	59	5.0	6	"	2	"	2	6	1		310				75	75	3,124	1 50
h Wm. Owens	"	"	"	42	5.0	6	"	2	"	2	4	1		200				75	75	1,310	1 50
h Henry Molley	North Alton	"	"	40	2.6	1	"	2	"	6	6	1		100				1 00	1 00	1,590	1 50
Totals										426	632	175	43		4,184		11			521,705	
Averages														212				[k] $0 55.4	$0 58.7		$0 80.2

a Miners paid by the day.
b Not operated since August 1, 1886.
c Not operated since August 9, 1886.
d Abandoned August 8, 1886.
e Not operated during summer.
f Not operated during the year.
g Operated only part of the year,
h New mine.
i Working out shaft pillars.
j New shaft, nipped out, prospecting for coal.
k Average price paid for mining per ton based on 218,979 tons.

MONTGOMERY COUNTY—FOURTH DISTRICT—1887.

Litchfield Coal Co	Litchfield	Shaft	Steam.	505	3.6	4	L.-W	2	Fan	13	22	8	2	190				$0 75	$0 75	10,220	$1 35
Totals										13	22	8	2							10,220	
Averages														190				$0 75	$0 75		$1 35

MORGAN COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Morgan County Coal Co	Franklin	Shaft	Steam.	202	4.6	5	P. R.	2	Fan.	9	9	4		150	92			$0 62½	$0 62½	3,769	$1 25
b Jacksonville C. and M.C.	Jacksonville	"	"	160	2.10	2	L. W.	1	"	12		4		90				*a*	*a*	1,440	1 75
c Thompson's Coal Mine	Bethel	"	Horse.	40			P. R.	2	Fur.	4	6	1		250				87½	87½	1,250	1 75
d Wm. Parker	Jacksonville	"	"	20	2.6	2	"	1	Nat'l.		5	1		100					1 00	210	1 25
Totals										25	20	10			92					6,669	
Averages														148				$0 68.7	$0 70		$1 45.2

a Miners paid by the day.
b New shaft.
c New shaft, operating on pocket coal.
d Mine closed by inspector, no escapement shaft.

SANGAMON COUNTY—FOURTH DISTRICT—1888.

Name of firm(company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift. slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches—feet	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Auburn Coal and Tile Co.	Auburn	Shaft	Steam.	268	6	6	P. R.	2	Fan.	8	25	3	2	262	680	..	....	$0 50	$0 50	15,200	$1 25
Chatham Coal Co.	Chatham.	"	"	252	6	6	"	1	"	15	50	10	3	200	563	..	....	50	50	13,895	93
Wabash C. & M. Co. No. 1.	Iles Junction	"	"	250	5.6	5	"	2	Fur.	25	40	20	6	200	560	..	....	67½	60	16,800	90
J. W. Moore & Co.	"	"	"	250	5.6	5	"	2	Fan.	50	100	20	5	220	2,378	..	1	60	60	58,800	90
Springfield Co-oper. C. Co.	Ridgely	"	"	250	5.6	5	"	2	"	20	50	13	3	275	1,150	..	....	60	60	31,500	90
a Wilmington and Springfield Coal Co	"	"	"	250	5.6	5	"	2	"	60	103	40	9	300	2,000	..	1	60	60	78,250	1 00
Springfield Coal & Tile Co.	"	"	"	254	5.6	5	"	2	"	50	75	10	3	200	2,000	..	....	62½	62½	52,500	90
West End Coal Co	Springfield	"	"	150	5.6	5	"	2	"	55	100	35	9	150	1,590	..	....	50	50	38,325	90
Capital Co-oper. Coal. Co.	"	"	"	242	5.6	5	"	2	"	44	44	30	9	250	2,100	..	....	62½	62½	56,800	90
Sangamon C. and M. Co.— No. 1	"	"	"	240	5.6	5	"	2	"	......	40	25	6	*b* 90	529	..	1	....	67½	11,109	90
No. 2	"	"	"	265	5.6	5	"	2	"	50	120	60	10	240	3,815	..	....	67½	67½	80,117	90
Illinois Fuel Co	Riverton.	"	"	240	5.6	5	"	2	"	90	90	20	7	200	1,865	..	....	67½	67½	48,956	90
Riverton C. and Min. Co	"	"	"	200	5.6	5	"	2	"	100	175	40	17	166	3,638	..	....	60	60	107,198	85
Barclay Coal and Min. Co.	Barclay	"	"	240	5.6	5	"	2	"	60	120	20	15	275	2,100	.	2	60	60	60,900	1 00
Wabash C. and M. Co. No. 2	Dawson	"	"	250	5.6	5	"	2	"	85	60	25	6	241	2,750	..	6	65	65	51,969	90
Beckman Coal and M. Co.	Pleasant Plains	"	"	130	6	5	"	2	"	10	30	5	....	300	290	..	....	65	65	8,072	1 10
Totals	......	......	......	....	....	..	......	..	......	722	1,222	376	110	......	28,008	..	11	....	....	730,391	....
Averages	......	......	......	....	....	..	......	..	......	....	....	....	....	232	......	..	....	$0 58.1	$0 58.0	....	$0 92.4

a One-half of the mining done by machinery.
b Not included in the average of days worked.

SCOTT COUNTY—FOURTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Wm. Bates & Co	Winchester	Shaft	Steam	100	2.6	1	P. R.	2	Fan	25	32	5		300	302			$1 12½	$1 12½	8,512	$1 60
John Stewart	"	Drift	Hand		2.6	1	"	2	Fur.	1	2			214				1 12½	1 12½	214	1 60
Chas. Poole	"	Shaft	Horse	30	2.6	1	"	2	"	1	3	1		200				1 12½	1 12½	298	1 60
Hugh McGuire	"	Drift	Hand		2.6	1	"	2	"	2	4			285				1 12½	1 12½	456	1 60
McGuire Bros	Alsey	Shaft	Horse	35	2.6	1	"	2	"	2	4	1		200				1 12½	1 12½	322	1 60
Totals										31	45	7			302					9,802	
Averages														240				$1 12½	$1 12½		$1 60

SHELBY COUNTY—FOURTH DISTRICT—1887.

		CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise?	Number of miners employ'd: Summer	Number of miners employ'd: Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining: Summer	Price per ton paid for mining: Winter	No. of tons of coal produced	Average value of coal per ton at the mine
John Richardson	Shelbyville	Shaft	Horse	70	2.2	15	P. R.	2	Fur.	4	8	1		180				$2 00	$2 00	1,800	$2 50
C. J. Kurtz	"	"	"	80	2.2	15	"	2	"	4	7	1		160				2 00	2 00	1,800	2 50
S. M. Kelly	"	"	"	50	2.2	15	"	2	"	4	6	1		158				2 00	2 00	1,300	2 50
Michael Brophy	"	"	"	90	2.2	15	"	2	"	4	4	1		170				2 00	2 00	1,140	2 50
a Eliga Tutal	"	"	"	60	2.2	15	"	2	"	2	4	1		160				2 00	2 00	600	2 50
John Minto	Robinson Creek	Drift	Hand		2.2	15	"	2	"	1	4			180				2 00	2 00	620	2 50
P. Porter	"	Shaft	Horse	20	2.2	15	"	2	"		5	1		160				2 00	2 00	640	2 50
a Henson & Daughbald	"	Drift	Hand		2.2	15	"	2	"	1	3			180				2 00	2 00	410	2 50
b J. P. Cummings & Co.	Fancher	Shaft	Horse	50	2.4	15	L. W.	1	Nat'l.											300	
a Andy Wade	"	Drift	Hand		2.4	15	P. R.	2	"	1	4			160				2 00	2 00	300	2 50
Totals										21	45	6								8,810	
Averages														167				$2 00	$2 00		$2 50

a New mines.
b Not operated since February 1, 1887.

RECAPITULATION BY COUNTIES—FOURTH DISTRICT—1887.

Counties.	Total No. of mines	No. of mines shipping coal	No. of mines in local trade.	Kinds of power employed.			Kinds of openings.			Modes of working coal.				No. of miners and other employés.			Average No. of days worked	No. of mules under ground	No. of kegs of powder used	No. of men killed	No. of men injured so as to lose time	Average price per ton paid for mining		No. of tons of coal produced	Average price of coal per ton at the mines	No. of mines with escapement shafts	No. of mines without escapement shafts	Kinds of power used for ventilation.			
				Steam	Horse	Hand	Shaft	Slope	Drift	Pillar and room	Long wall	Single entry	Double entry	Miners, summer	Miners, winter	Other employés						Summer	Winter					Fan	Furnace	Steam jet	Natural
Bond	2	2	...	2	....	....	2	....	....	2	..	....	2	40	58	16	250	2	1,070	1	....	$0 50	$0 55	36,076	$1 00	1	1	1	..	1	..
a Calhoun	1	1	...	....	1	....	....	1	....	1	..	....	1	....	....	....	....	....	....	..	....	....	....	....	....	1	....	1	..	..	..
Christian	1	1	...	1	....	....	1	....	....	1	..	....	1	*b* 85	*b* 130	36	293	7	661	..	2	*d*	*a*	149,973	83	....	1	1	..	..	..
Coles	1	1	...	1	....	....	1	....	....	....	1	....	....	75	100	24	260	5	....	..	....	75	75	34,612	1 50	....	1	1	..	..	..
a Edgar	1	1	...	1	....	....	1	....	....	1	..	....	1	....	....	....	....	....	....	..	....	....	....	....	....	1	....	1	1	..	..
Greene	9	..	9	....	3	6	3	....	6	9	..	9	....	36	55	10	178	....	....	..	....	75	75	12,578	1 50	9	....	..	9	..	..
a Jasper	1	..	1	....	1	....	....	1	....	1	..	1	....	....	....	....	....	....	....	..	....	....	....	....	....	1	....	..	1	..	..
Jersey	5	..	5	....	....	5	....	1	4	5	..	5	....	10	11	....	192	....	....	..	....	1 00	1 00	2,684	1 75	5	....	..	5	..	..
Macon	3	3	...	3	....	....	3	....	....	1	2	....	1	169	260	61	282	15	900	..	4	69.6	69.6	118,183	1 27.4	3	....	3	..	..	..
Macoupin	22	17	5	18	4	....	22	....	....	21	1	4	17	994	1,277	328	243	76	11,858	2	12	50.94	50.94	926,588	80.9	21	1	16	5	1	..
Madison	29	13	16	13	16	....	27	2	....	29	..	16	13	426	632	175	212	43	4,184	..	11	55.4	58.7	521,705	80.2	27	2	12	15	..	2
Montgomery	1	1	...	1	....	....	1	....	....	....	1	....	....	13	22	8	190	2	....	..	....	75	75	10,220	1 35	1	....	1	..	..	..
Morgan	4	1	3	2	2	....	4	....	....	3	1	....	3	25	20	10	148	....	92	..	....	68.7	70	6,669	1 45.2	2	2	2	1	..	..
Sangamon	16	16	...	16	....	....	16	....	....	16	..	2	14	722	1,222	376	232	110	28,008	..	11	58.1	58	730,391	92.17	15	1	15	1	..	..
Scott	5	1	4	1	2	2	3	....	2	5	..	4	1	31	45	7	240	....	302	..	....	1 12½	1 12½	9,802	1 60	5	....	1	4	..	..
Shelby	10	..	10	....	7	3	7	....	3	9	1	9	....	21	45	6	167	....	....	..	....	2 00	2 00	8,810	2 50	9	1	:	9	..	1
Totals	111	58	53	59	36	16	91	5	15	104	7	50	54	2,647	3,877	1,057	....	360	47,075	3	40	....	....	2,568,291	....	101	10	55	50	2	4
Averages	...	..	...	....	....	....	....	....	....	....	..	....	....	....	....	....	222	....	....	..	....	*c* $0 57.07	$0 57.85	....	$0 88.73	....	....	..	..	..	..

a Mines not operated.
b Not included in average price of mining.
c 631,411 tons not included in averaging prices for mining.
d Paid by the day.

Number of new mines opened 8
Number of mines permanently abandoned 7

WALTON RUTLEDGE, *State Mine Inspector*,
ALTON.

FIFTH DISTRICT.

Mr. J. S. Lord,

Secretary of the Bureau of Labor Statistics of Illinois:

Sir: In compliance with the law defining the duties of the Inspectors of Mines, I herewith submit my annual report for the year ending July 1, 1887, embracing statistics of the character and production of all the coal mines in the Fifth Inspection District, comprising the counties of Clinton, Gallatin, Jackson, Marion, Perry, Randolph, Saline, St. Clair, Washington and Williamson; also the list of fatal and other accidents which have occurred in and about the mines of the district.

Very respectfully,

Robert Winning, *Inspector.*

Fatal Casualties in the Fifth District—1887.

Date.	Name.	Place.	Age.	Married.	Single.	Children.	Cause of Accident.
1886.							
Aug. 10	Baldwin, Valentine	Equality	47	1	..	5	Car fell down shaft striking his head
Oct. 23	Bauer, John ✓	W. Belleville	58	1	..	..	Falling coal in mine
" 30	Whitehouse, John ✓	Dutch Hollow	35	..	1	..	Falling clod in mine
Nov. 16	Williams, Samuel ✓	Carbondale	26	..	1	..	Dragged from cage while ascending out of mine
" 19	Stahl, Thomas ✓	Centralia	18	..	1	..	Falling slate in mine
1887.							
Jan. 21	Kelly, Patrick ✓	Carbondale	51	1	..	5	" "
" 31	Humboldt, Frederick ✓	Grant Mine	22	..	1	..	Fell from car in mine
Feb. 4	Brooks, George ✓	W. Belleville	61	1	..	2	Falling coal in mine
" 23	Dixon, James Frank ✓	New Burnside	37	1	..	3	" "
" 26	Murphy, John ✓	Alma	40	1	..	5	Falling clod in mine
Apr. 9	Rusk, John ✓	Randolph Co	..	1	..	..	Falling soapstone in mine
Aug. 13	Cross, William ✓	W. Belleville	57	1	..	2	Falling slate in mine
" 19	Vogel, John ✓	Freeburg	40	1	..	5	Run over by pit-cars
Nov. 27	Lercher, Casper	W. Belleville	42	1	..	3	Falling clod in mine
	Totals		..	10	4	30	

Recapitulation of Fatal Casualties.

Cause of Accidents.	No.	Per cent.
Falling coal	3	21.4
Falling, clods, rock and stone	7	50.0
Cages	1	7.2
Pit-cars	3	21.4
Total	14	100

Non-fatal Casualties in the Fifth District—1887.

Date.		Name.	Place.	Age	Married	Single	Children	Cause of Accident.
1880.								
July	15	Mason, Eugene	White Oaks	44	1	..	4	Head cut by falling rock in mine
"	16	Danzer, Antoine	Wildermans	36	1	..	2	Foot burned by escaping steam.
	..	McMurtrie, Andrew	Ava	19	..	1	.	Legs bruised by falling coal in mine
Aug.	24	Fenn, Daniel	Trenton	..	1	..	..	Foot bruised by falling coal
Sept.	4	Benerdine, Joseph	Centralia	45	1	..	1	Injured by pit-car
"	6	Walters, Henry	"	30	..	1	..	Arms and legs hurt byfalling coal
"	10	Messner, Chris	"	25	1	..	..	Burned by explosion of gas
"	10	McCreery, John	"	35	1	..	..	" " "
"	25	Carson, Grant	O.Fallon	21	..	1	..	Leg broken by falling rock
Oct.	9	Clark, Van	DuQuoin	32	1	..	2	Leg broken by falling slate
"	11	Anderson, Robert	Carterville	26	1	..	1	Back injured by falling slate
"	16	Jones, John	"	..	1	..	..	Arm broken by falling slate
Nov.	6	Combs, Cormodine	Centralia	27	..	1	..	Hands and face burned by powder
"	6	Neilson, A. R	"	23	1	..	1	Hands and face burned by powder
"	15	Robinson, George	DuQuoin	18	..	1	..	Head and arms bruised by falling slate
Dec.	9	Krilling, Benhardt	N. Belleville	53	..	1	..	Leg broken by falling coal
"	9	Shurnefuth, John	Belleville	38	1	..	7	Shoulder-blade broken by falling coal
1887.								
Jan.	11	Percher, Jacob	Ridge Prairie	56	1	..	3	Legs broken by falling rock
"	12	Bara, Joseph	Smithton	22	..	1	..	Leg broken by falling coal
"	13	Forsythe, Joseph	St. Clair Co	..	1	..	..	Back and shoulders bruised by falling slate
Feb.	3	Brelzeheimer, Peter	Trenton	29	1	..	1	Arm broken by falling coal
"	18	Farmer, James	Carbondale	..	1	..	..	Bruised between pit-cars
Mar.	22	Cantwell, John	DuQuoin	19	..	1	..	Leg broken by falling slate
"	24	Nesbitt, William	Belleville	19	..	1	..	Leg broken by pit-cars
Apr.	4	Powers, Judge	St. Johns	22	..	1	..	Leg injured by falling coal
"	11	Dunn, William	DuQuoin	38	1	..	1	Back hurt by falling slate
May	2	Weaver, Howard	Ava	32	1	..	2	Injured by pit-cars
"	5	Cave, A. W	Sunfield	..	1	..	..	Leg broken by falling slate
"	8	Falkner, James	Carbondale	..	1	..	..	Back bruised by falling coal
"	8	Smith, James	Williamson Co.	43	1	..	7	Arm broken by falling coal
June	6	Lili, Jacob	Belleville	50	1	..	..	Foot crushed by falling coal
July	2	Reevil, Henry	Rentchler	45	1	..	7	" " "
Oct.	8	Sharpe, Peter	W. Belleville	67	1	..	..	Body injured by premature discharge of powder
Nov.	15	Perkins, William	Dutch Hollow	22	..	1	..	Injured internally by falling slate
		Totals		..	23	11	39	

RECAPITULATION OF NON-FATAL ACCIDENTS.

Cause of Accidents.	No.	Per cent.
Escaping steam	1	2.94
Explosion of gas	2	5.88
Explosion of powder	3	8.82
Falling coal	12	35.30
Falling rock	12	35.30
Pit-cars	4	11.76
Total	34	100.00

CLINTON COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd—Summer	Number of miners employ'd—Winter	No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining—Summer	Price per ton paid for mining—Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Consolidated Coal Co.	Trenton	Shaft	Steam	400	5.3	7	P. R.	2	Fan	* 42	42		7	168	267		3			42,490	$0 75
a " "	Breese	"	"	400	8.6	6	"	1	"	33	33	12	1	121	195			$0 50	$0 50	12,748	75
Totals										75	75	12	8		462		3			55,238	
Averages														144				*b* $0 50	$0 50		$0 75

a This mine now idle.
b Average price paid for mining based on 12,748 tons.

* Machine men.

JACKSON COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd—Summer	Number of miners employ'd—Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining—Summer	Price per ton paid for mining—Winter	No. of tons of coal produced	Average value of coal per ton at the mine
Bryden Coal and Coke Co	Ava&M'rph'sb'o	Slope	Steam	60	6	2	P. R.	2	Fan	80	100	20	5	210	570	..	3	$0 50	$0 50	60,000	$0 85
Carbondale Coal& Coke Co H. A. Blossom, Receiver.	Carterville & Murphysboro	Shaft	"	175	6	2	"	2	S'm.	55	63	18	6	151	......	..	4	60	60	40,439	87½
Gartside Coal Co. No. 1	Murphysboro	"	"	117	6.6	2	"	2	"	15	45	3	4	220	......	..	....	75	75	22,000	1 00
" " 4	"	"	"	140	6.6	2	"	2	Fur.	.....	15	2	1	60	10	..	....	a	......	200	1 00
Big Muddy Coal & Coke Co	DeSoto	"	"	45	8	7	"	2	"	38	53	17	3	233	655	..	....	50	50	26,883	90
St. Louis Ore and Steel Co	Murphysboro	"	"	170	6	2	"	2	Fan	a 203	203	....	14	275	1,650	2	3	a	......	215,690	....
Carbon Hill Mines	Carbondale	Drift	Horse	60	5 6	2	"	2	Fur.	4	7	3	....	225	118	..	....	75	87½	2,506	1 00
b Philips Bros	Ava	Shaft	"	16	6	3	"	2	"	6	.....	1	....	75	20	..	....	50	50	600	85
George Wright	Boskeydell	Drift	Hand	40	2.3	2	"	2	"	4	6	1	....	225	40	..	....	90	90	1,200	1 50
Henry Delzeler	Ava	"	"	18	6	3	"	2	"	6	8	1	1	212	60	..	....	50	50	4,200	85
Other small mines																				2,000	85
Totals										411	500	66	34	......	3,123	2	10	......	......	375,718	....
Averages														188				$0 56.7	$0 57	....	$0 89.27

a Machine men.
b New mine.

c Average price paid for mining based on 157,828 tons.

MARION COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise?	Number of miners employ'd		No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Sandoval Coal Co.	Sandoval.	Shaft	Steam.	609	6	5	P. R.	2	Fan.	60	100	30	10	200	1,200			$0 50	$0 50	56,415	$0 80
Centralia Mining & M. Co.	Centralia.	"	"	569	6	5	"	2	"	75	110	50	18	280	1,400	1	3	62½	62½	35,000	1 00
*a*Odin Coal Co.	Odin	"	"	756	7.6	6	"	1	Nat'l.	7	16	7		200	275			50	50	2,000	1 09
*a*Kinmundy Coal Co	Kinmundy	"	"	876	4.11	5	"	1	"	10	10	4		150	60			62½	62½	2,500	1 00
*a*Salem Coal Co.	Salem	"	"	867	4.10	5	"	1	"	8	16	4		200	80			62½	62½	3,000	1 00
Totals										160	252	95	28		3,015	1	3			98,915	
Averages														206				$0 55.1	$0 55.1		$0 88.59

a New mine.

PERRY COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individul operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employès in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced.	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Enterprise Coal & Coke Co	DuQuoin	Shaft	Steam.	180	7.6	6	P. R.	2	Fur	50	80	30	8	185	1,045	..	....	$0 50	$0 62½	36,510	$0 92½
Perry Co. Coal and Min.Co	"	"	"	66	5.6	6	"	2	Fan	36	56	22	5	203	834	..	3	50	50	23,664	90
Sun Coal and Coke Co	Sunfield	"	"	80	5.6	6	"	2	"	36	36	19	4	177	711	..	1	54	54	23,123	90
D. C. Barbour & Sons	Tamaroa	"	"	200	6	6	"	2	"	13	18	7	4	275	480	..	....	50	50	11,000	90
P. White—Cox Coal Co.	"	"	"	200	5.6	6	"	2	"	15	25	10	4	225	350	..	....	50	50	12,540	90
Ill. Cent. Coal & Salt Co	St. Johns	Slope	"	410	6	7	"	2	Fur	150	150	50	40	230	1,653	..	4	49	61¼	110,599	95
DuQuoin Coal Mining Co.	DuQuoin	Shaft	"	40	6	7	"	2	Fan	105	125	35	15	225	2,000	..	1	56¼	62½	67,500	75
Wm. Greenwood	"	"	Horse.	45	6	7	"	2	Fur	4	10	2	1	245	60	..	2	50	62	4,000	65
Richard Baillie	"	"	Steam.	40	6	7	"	2	"	10	10	4	2	250	180	..	....	90	90	10,500	90
Frizzell Coal Mining Co	"	"	"	30	6	7	"	2	"	6	14	4	2	206	206	..	....	50	50	5,964	80
Gallum Mine	Conants	"	"	71	6	6	"	2	"	15	25	4	2	312	160	..	....	37½	43	9,412	68
Malone & Miller	Pinckneyville	"	Horse.	40	6	6	"	2	"	2	8	1	....	214	55	..	....	50	50	1,240	1 00
Moon Co-operative C. Co.	DuQuoin	"	"	47	6	7	"	2	"	10	14	3	1	210	90	..	....	50	50	3,500	90
Totals										452	571	191	88		7,824	..	11			319,552	
Averages														227				$0 52.2	$0 59.5		$0 87.77

RANDOLPH COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Consolidated Coal Co	Coulterville	Shaft	Steam.	320	6	5	P. R.	2	Fan.	14	14	9	2	74	120			$0 50	$0 50	6,098	$0 75
*a*Bernard Coal Co	Percy	"	"	100	5.3	5	"	2	Fur.	18	18	7	4	180	298			50	50	10,158	80
Golby & Dean, No. 1	"	"	"	80	6	6	"	2	"	25	40	6		239	490			43	50	14,942	83
" " 2	"	"	"	96	5	5	"	2	"	10	20	5		154				50	56		
D. B. Boyd	Sparta	"	"	80	6	6	"	2	"	25	25	9	2	250	360	1		43¾	50	14,500	75
John L. Atchinson	Blair	"	Horse.	36	5	5	"	2	"	1	4	1		200	30			56¼	56¼	900	1 00
Stanway & Morris	Sparta	"	Hand.	10	4.9	5	"	2	"	1	3			230	23					965	1 00
R. H. Roseborough	"	"	Steam.	25	6	6	"	2	"	25	30	6	4	256	360			37½	50	15,500	65
Roseborough & Moffat	Percy	"	"	25	5	6	"	2	"	14	20	3		220	200			50	62½	5,500	85
J. T. Weir & Son.	Sparta	Slope	Horse.	30	4.6	5	"	2	"	6	10	1		210	45			62½	62½	3,700	1 00
Other small mines																				2,000	1 00
Totals										139	184	47	12		1,926	1				74,263	
Averages														201				*b* 45.2	52.5		$0 78.12

a This mine is now in a Receivers hands.

b Average price paid for mining based on 71,298 tons.

SALINE, GALLATIN AND JOHNSON COUNTIES—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft........	Steam, horse or hand-power........	Depth of coal below the surface—feet........	Thickness of coal—feet and inches........	Geological No. of seam....	Long-wall, or pillar and room workings........	No. of places of egress....	Ventilation, by fan, furnace or otherwise........	Number of miners employ'd		No. of other employés, in and about mine........	No. of mules employed under ground........	No. of days worked during the year........	No. of kegs of powder used during the year........	No. men killed during year	No. of men injured so as to lose time........	Price per ton paid for mining.		No. of tons of coal produced........	Average value of coal per ton at the mine........
										Summer........	Winter........							Summer........	Winter........		
Davenport & Co	Harrisburgh...	Shaft..	Steam.	25	5.6	5	P.-R.	2	Fur.	15	30	3	2	213	100	..	....	$9 62½	$0 62½	10,000	$0 90
John Dupont, Union Mine	New Burnside..	Drift ..	Mules..	40	3.6	3	"	2	"	30	60	18	5	214	922	1	....	62½	62½	28,000	88
Eldorado Coal Co..........	Eldorado.......	Slope.	Steam.	25	4.6	6	"	2	"	8	12	5	2	200	100	..	....	62½	62½	4,000	1 00
Jabez Burgan.............	Stonefort.......	Shaft..	Horse.	20	3.6	3	"	2	"	2	2	1	....	130	5	..	....	62½	62½	518	1 25
John Donahue............	Equality.......	" ..	"	35	4.6	6	"	2	"	4	8	1	....	280	40	..	....	75	75	1,437	1 25
Equality Coal Co..........	"	" ..	Steam.	80	4.6	6	"	2	Fan.	20	50	12	4	250	700	1	....	62½	62½	30,000	1 00
Other small mines........	....	....	....	....	....	..	....	..	....	.....	40	....	....	......	......	..	....	....	....	5,000	1 00
Totals	....	....	....	....	....	..	....	..	....	79	202	40	13	......	1,867	2	....	....	....	78,955	....
Averages	....	....	....	....	....	..	....	..	....	.....	.....	....	....	214	......	..	....	*a* 62.7	62.7	....	$0 95

a Average price paid for mining based on 73,955 tons.

ST. CLAIR COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	Character of Plant.								Employes.										Product.	
		Drift, slope or shaft	Steam, horse or hand power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year.	No. of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
A. Brandenberger & Co	St. Louis	Shaft	Steam.	90	7	6	P. R.	2	Fan.	50	60	20	6	225	2,500	..	4	*a*	......	88,000	......
Joseph Taylor	Ridge Prairie	"	"	200	6	6	"	2	"	40	50	7	4	210	221	..	....	$0 50	$0 50	25,608	$0 75
Rose Hill Mining Co	West Belleville.	"	"	130	6	6	"	2	"	24	24	3	3	220	156	..	....	43¾	43¾	15,965	68¾
John Maule	Belleville.	Slope	"	60	6	6	"	2	Fur.	10	20	2	1	200	5	..	....	50	50	10,000	75
Adam Ogden & Sons	Rentchler	Shaft	"	125	6	6	"	2	"	14	18	3	1	250	210	..	....	43¾	43¾	10,000	75
Abraham Lloyd & Son	"	"	"	114	6.6	6	"	2	"	17	28	3	2	212	300	..	1	43¾	43¾	12,951	75
Feurhan & Muskopf	Millstadt	"	Horse.	48	6	6	"	2	"	2	6	1	....	200	5	..	....	50	50	1,950	1 80
Millstadt Coal and M. Co.	"	"	Steam	114	6.6	6	"	2	"	12	14	2	....	195	......	..	....	44	44	7,116	67½
St. Louis and High Prairie Coal and Mining Co	"	"	Horse.	40	5.6	6	"	2	"	4	9	2	....	250	80	..	....	43¾	43¾	3,567	75
P. J. Vancourt	O'Fallon	"	Steam	135	5.6	6	"	2	"	12	20	3	3	220	100	..	....	50	50	5,000	90
Johnson Coal Co	West Belleville.	"	"	120	6	6	"	2	"	16	16	3	2	260	350	..	....	50	50	19,200	50
George Reuther	Belleville.	"	Horse.	90	6.6	6	"	2	"	4	8	2	....	250	12	..	....	40	40	1,800	90
Millstadt Union Coal Co.	Millstadt.	"	Steam	45	6,6	6	"	2	"	25	25	3	....	......	......	..	....	43¾	43¾	3,600	75
Consol. Coal Co—St. Louis																					
Garsides No. 4	Ridge Prairie	"	"	179	6	6	"	2	"	*d* 60	60	....	4	220	410	..	1	*a*	......	51,190	75
Yock mine	Belleville	"	"	150	6.6	6	"	2	Fan.	*d* 45	45	....	4	234	426	1	....	*a*	......	40,096	75
Grant mine	"	"	"	130	6.6	6	"	2	Fur.	*d* 58	58	....	3	181	222	1	....	*a*	......	33,662	75
Richland mine	"	"	"	100	8.6	6	"	2	Fan.	*d* 76	76	....	3	177	517	..	....	*a*	......	46,104	75
Schureman Bros	"	"	"	150	6	6	"	2	Fur.	*d* 58	58	....	6	215	427	..	....	*a*	......	49,910	75
Menton mine	O'Fallon	"	"	200	6.6	6	"	2	"	*d* 96	96	....	5	160	402	1	2	*a*	......	54,968	76
b Poynton mine	Belleville	"	"	150	6	6	"	2	"	11	11	5	1	90	20	..	....	50	50	5,423	75
Concordia mine	"	"	"	60	6	6	"	2	"	26	26	5	2	198	......	..	....	50	50	17,366	75
Enterprise mine	"	"	"	120	7.6	6	"	2	"	11	11	5	1	115	75	..	....	50	50	8,534	75

St. Clair County—*Continued.*

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT. Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation by fan, furnace or otherwise	EMPLOYES. Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés in and about the mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	PRODUCT. No. of tons of coal produced	Average value of coal per ton at the mine
Consol. Coal Co.—*Con.*																					
Green Mount	Belleville	Shaft	Steam.	140	6	6	P. R.	2	Fan	18	18	3	1	200	150	..	....	$0 50	$0 50	12,708	$0 75
White Oak	Marissa	''	''	120	6.6	6	''	2	''	50	50	18	3	156	979	..	....	50	50	37,305	75
Marissa	''	''	''	120	6.6	6	''	2	Fur.	24	24	10	3	122	407	..	....	50	50	19,957	75
Lenzburgh	Lenzburgh	''	''	60	6.6	6	''	2	''	16	16	7	3	121	303	..	....	50	50	17,771	75
Freeburgh	Freeburgh	''	''	140	7.6	6	''	2	Fan.	14	14	8	2	83	120	..	....	50	50	9,596	75
Heinrich	Heinrich	''	''	100	6	6	''	2	''	20	20	4	2	197	75	..	....	50	50	11,897	75
b Lebanon	Lebanon.	''	''	189	5.6	6	''	2	St'm.	24	24	16	2	60	188	..	1	50	50	8,854	75
Pittsburgh	Pittsburgh	''	''	134	6.6	6	''	2	Fur.	10	10	2	1	250	150	..	....	50	50	8,610	75
Northwestern	''	''	''	172	6	6	''	2	Fan.	20	20	3	2	200	125	..	....	50	50	12,649	75
Renicke	Birkner	''	''	180	6	6	''	2	''	*d* 31	31	....	5	216	621	1	....	*a*	......	46,925	75
Bennett	Lebanon	''	''	180	6	5	''	2	''	18	18	2	1	173	150	..	....	50	50	9,974	75
b Rondal	Birkner	''	''	135	6	6	''	2	''	18	18	6	2	50	43	1	....	50	50	3,466	75
Abbey	Collinsville	''	''	140	7.6	6	''	2	''	*d* 108	108	....	7	249	1,045	..	5	*a*	......	100,437	75
b Skellett	Belleville	''	''	150	6	6	''	2	''	*d* 32	32	....	2	81	75	..	....	*a*	......	9,519	75
Dutch Hollow	Birkner	''	''	130	6	6	''	2	''	10	10	2	1	266	100	..	....	50	50	10,618	75
Knecht	''	''	''	120	7	6	''	2	''	*d* 62	62	....	4	180	264	..	....	*a*	......	42,457	75
b Lenz	''	''	''	130	6	6	''	2	Fur.	22	22	5	1	55	55	..	....	50	50	3,956	75
Humboldt Mining Co.	Belleville	''	''	108	6	6	''	2	Fan.	25	30	4	1	275	175	..	....	50	50	12,800	71¼
Bruggeman & Hortman, Nos. 1 & 2	''	''	''	90	6	6	''	2	Fur.	45	45	8	3	250	280	..	....	50	50	28,000	75
b Morris Mine, Consolidated Coal Co.	Lebanon	''	''	180	5	6	''	2	''	20	25	5	2	140	110	..	....	50	50	9,100	87½
William Crowson & Son	Rentchler	''	''	120	6	6	''	2	''	20	25	5	2	300	150	..	....	50	50	15,300	75
John H. Bee	Belleville.	''	Horse.	130	6.6	6	''	2	St'm.	.....	3	1	....	140 *c*		..	....	......	50	900	75

Haig & Doyle	Caseyville	Drift	"	60	6	6	"	2	"	2	2	1	1	200	c	..	....	50	50	1,000	1·25
George Grossman	Smithton	"	"	25	6	6	"	1	Nat'l.	2	2	....	....	200	c	..	....	50	50	1,200	1 25
Benjamin Yonson	"	Shaft	Horse.	45	6	6	"	2	"	2	2	1	....	125	c	..	....	50	50	600	1 25
Lawrence Faber	French Village	Slope	"	100	7	6	"	2	"	2	2	1	1	150	c	..	....	50	50	240	1 00
Drexel & Johnson	Belleville	Shaft	"	55	6.6	6	"	2	Fur...	8	8	2	1	200	c	..	....	50	50	3,000	1 00
James Beatty	Mascoutah	"	Steam.	160	7	6	"	1	St'm.	9	9	4	1	160	c	..	....	50	50	2,400	1 50
Marsh & Son	Birkner	"	"	135	6	6	"	2	Fur..	15	15	3	1	200	c	..	....	50	50	4,500	75
Summerfield Coal Co	Summerfield	"	"	285	5	6	"	1	St'm	12	12	4	....	140	c	..	....	50	50	2,000	1 50
Jno. Kloess & Son	Belleville	"	"	110	6	6	"	2	Fan .	85	85	8	3	300	c	1	1	50	50	6,500	1 00
Gelwicks & Herlbach	"	"	Horse.	60	6.6	6	"	2	Fur..	8	8	4	....	200	c	..	....	50	50	3,400	1 00
F. Murphy	"	"	"	45	6	6	"	2	"	18	18	2	....	200	c	..	....	50	50	4,600	1 00
Sebastian Kronerberger	"	"	"	60	6	6	"	2	"	7	7	3	....	210	c	..	....	50	50	2,500	1 00
Conrad Renicke	"	"	Steam.	130	7	6	"	2	"	35	35	6	....	230	3	..	....	50	50	25,000	1 00
Steam Supply Co., Brown's Mine	"	"	"	65	6.6	6	"	2	Fan .	6	6	2	....	225	c	..	....	50	50	2,800	1 00
Harris Bros	St. Louis	"	"	200	6	6	"	2	"	23	23	3	2	210	c	..	....	50	50	8,600	1 00
Four small mines										....	12	....	....			..	....			5,000	
Totals										1,512	1,610	838	111		12,006	6	15			1,018,149	
Averages														160				[e] 0 49.22	0 49.22		$0 76.81

a Machine mine, men paid by the day.
b Abandoned.
c Use powder more or less.
d Machine men.
e Average price of mining based on 449,881 tons.

WASHINGTON COUNTY—FIFTH DISTRICT—1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall, or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd Summer	Number of miners employ'd Winter	No. of other employés in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No. of men injured so as to lose time	Price per ton paid for mining. Summer	Price per ton paid for mining. Winter	No. of tons of coal produced	Average value of coal per ton, at the mine
Consolidated Coal Co., Joseph Morris, Lessee	Nashville	Shaft	Steam.	420	6	6	P. R.	2	Fan	24	43	8	3	226	618		1	$0 56¼	$0 56¼	18,806	$1 00
G. W. Brown Coal Co.	DuBois	"	"	300	5.6	6	"	2	Fur.	20	30	14	3	200	720		3	50	50	18,914	90
*White Smoke Co.	Okawville	"	"	325	5.6	6	"	1	St'm.	5	5	2		200	48			75	75	2,500	1 75
Totals										49	78	24	6		1,386		4			40,220	
Averages														208				$0 54.5	$0 54.5		$0 99.95

*Sinking escapement.

WILLIAMSON COUNTY—FIFTH DISTRICT--1887.

Name of firm, company or individual operating mine.	Town or post-office nearest the mine.	CHARACTER OF PLANT.								EMPLOYES.										PRODUCT.	
		Drift, slope or shaft	Steam, horse or hand-power	Depth of coal below the surface—feet	Thickness of coal—feet and inches	Geological No. of seam	Long-wall or pillar and room workings	No. of places of egress	Ventilation, by fan, furnace or otherwise	Number of miners employ'd		No. of other employés, in and about mine	No. of mules employed under ground	No. of days worked during the year	No. of kegs of powder used during the year	No. men killed during year	No of men injured so as to lose time	Price per ton paid for mining.		No. of tons of coal produced	Average value of coal per ton at the mine
										Summer	Winter							Summer	Winter		
Carterville Coal & Coke Co	Carterville	Shaft	Steam.	60	9.6	7	P. R.	2	Fan	90	90	....	7	232	2,122	..	2	*c*	......	80,884	$0 80
Crystal Plate G. Co. No. 1.	"	"	"	45	9.6	6	"	*1	St'm.	*b* 19	48	....	2	70	304	..	....	*b*	......	14,500	75
Adam Young	"	"	Horse.	20	9.6	7	"	2	Fur.	2	3	1	....	200	16	..	....	50	50	1,054	1 00
Wm. Tippet	Marion	Drift	"	20	7	7	"	2	"	1	3	1	1	200	8	..	....	37½	50	3,900	1 00
W. M. Reid	"	Slope	"	20	6.6	7	"	2	"	2	4	1	1	......	15	..	....	37½	50	2,000	1 00
Willoughby	"	Drift	"	20	6.6	7	"	2	"	2	5	1	1	210	20	..	....	37½	50	4,000	1 00
Other mines and strippi'gs	......	......	......	....	....	..	......	..	......	....	....	....	....	......	......	..	....	......	......	6,000	1 00
Totals	......	......	......	....	....	..	......	.	......	116	153	4	12	......	2,485	..	2	......	......	112,338	......
Averages	......	......	......	....	....	..	......	..	......	....	....	....	....	182	......	..	....	*d* 38.7	50	......	$0 82.37

* Sinking escapement.

b Machine mine—miners paid by the yard.

c Machine mine.

d Average price paid for mining based on 10,954 tons.

RECAPITULATION BY COUNTIES —FIFTH DISTRICT—1887.

Counties.	No. of mines	No. of mines shipping coal	No. of mines in local trade	Kinds of power employed			Kinds of openings.			Modes of working coal.				No. of miners and other employés.			Average No. of days worked	No. of mules under ground	No. of kegs of powder used	No. of men killed	No. of men injured so as to lose time	Average price per ton paid for mining.		No. of tons of coal produced	Average price of coal per ton at the mines	No. of mines with escapement shafts	No. of mines without escapement shafts	Kinds of power used for ventilation.			
				Steam	Horse	Hand	Shaft	Slope	Drift	Pillar and room	Long wall	Single entry	Double entry	Miners, summer	Miners, winter	Other employés						Summer	Winter					Fan	Furnace	Steam jet	Natural
Clinton	2	2	...	2	....	....	2	..	....	2	..	....	2	75	75	12	144	8	462	..	3	$0 50	$0 50	55,238	$ 75	1	1	2	...	..	...
Jackson	10	6	4	6	2	2	6	1	3	10	..	3	7	411	500	66	188	34	3,123	2	8	56.7	57	375,718	89.27	10	....	2	6	2	...
Marion	5	5	...	5	....	....	5	..	....	5	..	....	5	160	252	95	206	28	3,015	1	5	55.1	55.1	98,915	88.59	2	3	2	...	3	...
Perry	13	12	1	10	3	....	12	1	....	13	..	7	6	452	571	191	227	88	7,824	..	6	52.2	59.5	319,552	87.77	13	....	5	8	..	...
Randolph	10	8	2	7	2	1	9	1	....	10	..	6	4	139	184	47	211	12	1,926	1	....	45.2	52.5	74,263	78.12	10	....	1	9	..	...
Saline Gallatin Johnson	6	4	2	3	3	....	4	1	1	6	..	4	2	79	202	40	214	13	1,867	2	....	62.7	62.7	78.955	95	6	....	1	5	..	...
St. Clair	63	42	21	47	14	2	59	2	2	63	..	34	29	1,512	1,610	838	180	111	12,006	8	11	49.22	49.22	1,018,149	76.81	60	3	21	30	4	8
Washington	3	2	1	3	....	....	3	..	....	3	..	....	3	49	78	24	208	6	1,386	..	4	54.5	54.5	40,220	99.95	2	1	1	1	1	...
Williamson	6	2	4	2	4	....	2	2	2	6	..	4	2	116	153	4	152	12	2,485	..	1	38.7	50	112,338	·82.37	5	1	1	4	1	...
Totals	118	83	35	85	28	5	102	8	8	118	..	58	60	2,993	3,625	1,359	.....	312	34,094	14	38	....	....	a2,173,348	......,	109	9	36	63	11	8
Averages	....	..	...	..	....	....	....	..	....	....	..	....	...	.....	.....	.....	192	....	......	..	....	$0 51.83	$0 54.52	....	$ 82.48	....	....	..	...	..	...

Number of new mines opened, ... 5
Number of mines permanently abandoned..................... 6

a 937,997 tons not included in averaging prices for mining.

Aggregate Tons of Coal Mined in each County in the State of Illinois, and the Value of the same at the Mines for a series of Seven Years, with the Totals for the Districts and for each Year, and for the State.

DISTRICTS AND COUNTIES.		1880.	1882.	1883.	1884.	1885.	1886.	1887.	Totals.
		(Census) Aggregate tons and val'e at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.
THE STATE	Tons	6,115,377	9,115,653	10,030,991	10,101,005	9,791,874	9,246,435	10,278,890	64,680,225
	Value	$8,779,832	$13,764,636	$14,845,867	$12,727,266	$11.456,492	$10,263,543	$11,152,596	$82,990,232
FIRST DISTRICT	Tons	1,631,440	2,540,532	2,495,072	2,507,370	2,519,397	2,326,742	2,686,829	16,707,382
	Value	$2,508,371	$4,345,812	$3,874,076	$3,878,925	$3,559,287	$3,045,164	$3,537,394	$24,749,029
Grundy	Tons	183,812	506,402	526,888	713,234	793,424	776,625	792,954	4,293,339
	Value	281,355	982,420	922,054	1,048,454	1,158,399	1,031,358	1,068,218	6,492,258
Kankakee	Tons	1,600	1,600	32,500	63,000	47,000	73,678	97,000	316,378
	Value	3,600	3,600	69,875	94,500	61,100	103,149	130,950	466,774
LaSalle	Tons	716,487	1,169,030	1,010,857	1,064,384	1,127,674	980,382	1,125,235	7,194,049
	Value	1,067,384	1,957,492	1,496,068	1,731,398	1,590,020	1,265,673	1,489.949	10,597,984
Livingston	Tons	118,230	214,100	225,400	201,095	183,844	208,545	387,600	1,538,814
	Value	171,124	428.200	371,910	302,983	253,704	259,430	480,972	2,268,323
Will	Tons	611,311	649,400	699,427	465,657	367,455	287,512	284,040	3,364,802
	Value	984,908	974,100	1,014,169	701,590	496,064	385,554	367,305	4,923,690
SECOND DISTRICT	Tons	696,046	710,526	831,522	728,341	723,077	704,723	1,069,027	5,463,262
	Value	$1,249,478	$1,312,858	$1,548,245	$1,261,058	$1,242,239	$1,106,860	$1,600,007	$9,320,745
Brown	Tons	400	....	....	....	....	....	....	400
	Value	800	....	....	....	....	....	....	800
Bureau	Tons	65,890	61,454	77,381	88,564	95.067	140,562	429,580	958,498
	Value	115,781	124,751	147,797	140,595	154,009	190,588	601,412	1,474,933
Hancock	Tons	....	....	....	4,555	7,176	8,550	6,208	26,489
	Value	....	....	....	9,110	14,208	13,962	10,262	47,542
Henry	Tons	155,695	216,760	223,578	185,860	167,895	137,817	117,533	1,205,138
	Value	251,633	411,844	402,440	314,103	271,990	206,036	177,005	2,035,051

Tons and Value of Coal Mined—Continued.

Districts and Counties.		1880.	1882.	1883.	1884.	1885.	1886.	1887.	Totals.
		(Census) Aggregate tons and val'e at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.	Aggregate tons and value at the mines.
Knox	Tons...	26,462	33,836	40,968	43,467	44,661	38,154	64,324	291,872
	Value..	$39,087	$60,904	$59,813	$67,374	$70,564	$56,977	$83,493	$438,212
Marshall	Tons,..	5,459	5,450	6,640	21,576	44,272	56,174	73,928	213,490
	Value..	9,536	9,536	12,151	32,580	67,736	80,329	109,783	321,651
McDonough	Tons...	82,304	110,451	189,350	113,937	109,723	91,467	110,103	807,335
	Value..	162,696	193,289	337,043	186,202	200,793	149,274	180,239	1,409,536
Mercer	Tons...	79,531	100,860	144,434	118,513	109.417	103,329	127,708	783,792
	Value..	131,180	176,505	270,091	225,175	206,798	191,159	214,549	1,415,457
Rock Island	Tons...	237,589	131,081	118,301	104,643	102,980	87,713	85,282	867,589
	Value..	476,016	249,054	257,896	203,007	183,304	153,428	146,840	1,669,545
Schuyler	Tons...	5,115	5,115	....	12,876	7,082	10.123	22,686	62,997
	Value..	7,849	7,849	....	21,406	10,765	13,194	25,181	86,244
Stark	Tons ..	22,143	22,143	15,340	17,126	19,455	17,198	17,865	131,270
	Value..	28,868	28,868	26,538	27,402	32,295	25,768	25,833	195,572
Warren	Tons ..	15,467	23,376	15,530	17,224	15,349	13,636	13,810	114,392
	Value..	26,032	50,258	34,476	34,104	29,777	26,145	25,410	226,203
THIRD DISTRICT	Tons...	1,185,189	1,350,020	1,685,108	1,932,881	1,811,405	1,518,445	1,781,395	11,264,443
	Value..	$1,665,301	$1,933,281	$2,436,254	$2,529,635	$2,271,173	$1,763,448	$1,957,537	$14,556,629
Cass	Tons...	....	....	....	3,425	2,225	3,227	2,325	11,203
	Value..	....	....	....	5,708	4,450	6,422	3,253	19,833
Fulton	Tons ..	336,171	240,315	265,664	298,431	280,005	238,542	337,215	1,996,343
	Value..	419,265	300,394	371,929	379,006	338,806	279,094	360,449	2,448,943
Logan	Tons...	60,000	65,000	80,000	118,800	172,000	180,000	159,000	834,800
	Value..	79,000	91,000	121,600	159,984	230,480	230,400	181,650	1,094,114
McLean	Tons...	63,000	60,000	60,000	125,000	135,000	120,600	141,700	705,300
	Value..	113,400	90,000	90,000	181,250	168,750	132,660	175,050	951,110

Menard	Tons	61,120	95,998	134,275	151,749	139,130	127,464	155,621	865,347
	Value	78,930	143,997	201,412	188,948	164,162	134,857	150,530	1,062,836
Peoria	Tons	273,640	419,087	515,458	452,078	515,675	386,852	452,123	3,014,913
	Value	402,384	611,871	768,032	583,181	634,280	435,209	472,899	3,907,856
Tazewell	Tons	61,348	36,177	109,372	33,590	23,780	34,881	51,847	350,995
	Value	91,922	54,265	123,590	52,736	34,723	38,718	55,097	451,051
Vermilion	Tons	228,850	343,443	416,339	620,808	423,860	305,679	359,119	2,698,098
	Value	305,400	484,254	603,691	785,322	517,109	354,588	403,308	3,453,672
Woodford	Tons	101.060	90,000	104,000	129,000	119,740	121,200	122,445	787,445
	Value	175,000	157,500	156,000	193,500	178,413	151.500	155.301	1,167,214
FOURTH DISTRICT	Tons	1,027,214	2,075,244	3,028,368	2,804,183	2,615,992	2,749,813	2.568,291	16,869,105
	Value	$1,426,498	$2,718,837	$3,903,404	$3,161,665	$2,571,595	$2,664,470	$2,289,641	$18,746,110
Bond	Tons	....	....	....	....	7,000	18,560	36,076	61,636
	Value	....	....	....	....	7,700	21,344	36,076	65,120
Calhoun	Tons	....	....	....	160	200	....	....	360
	Value	....	....	....	200	270	....	....	470
Christian	Tons	....	....	....	....	33,203	102,565	149,973	285,741
	Value	....	....	....	....	34,199	89,232	124,478	247,909
Coles	Tons	320	....	13,000	54,000	31,000	39,110	34,612	172,042
	Value	550	....	26,000	67,500	38,750	58,660	51,918	243,378
Edgar	Tons	....	....	14,419	21,720	16,200	18,028	....	70,361
	Value	....	....	20,186	31,494	20,950	22,528	....	95,158
Greene	Tons	3,260	3,260	7,005	15,840	16,080	12,172	12,578	70,195
	Value	4,770	4,770	13,099	27,297	28,140	18,258	18,867	115,201
Jasper	Tons	24	....	1,000	10,000	8,100	826	....	19,950
	Value	60	....	2,000	20,000	16,200	1,652	....	39,912
Jersey	Tons	2,300	2,300	2,700	2,920	2,865	2,160	2,684	17,929
	Value	3,815	3,815	5,400	5,110	5,014	3,780	4,697	31,631
Macon	Tons	....	....	75,634	120,470	132,000	115,272	118,183	561,559
	Value	....	....	98,324	163,839	175,560	153,312	150,575	741,610
Macoupin	Tons	247,284	780,925	1,233,200	1,164,409	1,080,211	1,085,539	926,588	6,518,156
	Value	319,832	898,063	1,578,496	1,234,274	1,018,997	990,012	750,216	6,789,890
Madison	Tons	273,807	578,000	767,200	560,636	601,816	604,214	521,705	3,911,878
	Value	415,282	881,200	1,020,376	591,471	486,888	532,916	418,370	4,346,503

Tons and Value of Coal Mined—Continued.

Districts and Counties.		1880, (Census.) Aggregate tons and value at the mines.	1882. Aggregate tons and value at the mines.	1883. Aggregate tons and value at the mines.	1884. Aggregate tons and value at the mines.	1885. Aggregate tons and value at the mines.	1886. Aggregate tons and value at the mines.	1887. Aggregate tons and value at the mines.	Totals. Aggregate tons and value at the mines.
Montgomery	Tons...	42, 400	42, 400	25, 000	10, 717	8, 057	8. 666	10, 220	148, 360
	Value..	74, 200	74, 200	37, 500	16, 076	11, 644	11, 699	13, 797	239, 116
Morgan	Tons. ..	13, 500	13, 500	600	2, 500	8, 500	6, 253	6, 669	51, 522
	Value..	19, 065	19, 065	1, 050	2, 817	12, 750	8, 004	9, 681	72, 432
Sangamon	Tons...	427, 619	632, 835	861, 620	820, 326	649, 729	720, 153	730, 391	4, 842, 673
	Value..	575, 799	803, 700	1, 051, 176	959, 781	675, 698	720, 153	673, 258	5, 459, 565
Scott	Tons...	5, 709	19, 924	18, 806	10, 280	9, 950	8, 349	9, 802	82, 811
	Value..	9, 975	28, 690	29, 337	18, 641	15, 622	13, 358	15, 683	131, 306
Shelby	Tons...	6, 504	2, 100	8, 184	10, 205	10, 181	7, 952	8. 810	53, 932
	Value..	13, 150	5, 334	20, 460	23, 165	23, 213	19, 562	22, 025	126, 909
FIFTH DISTRICT	Tons...	1, 579, 984	2 439, 331	1, 990, 921	2, 128, 229	2, 122, 003	1, 946, 712	2, 173, 348	14, 380, 528
	Value..	$1, 920, 184	$3. 185, 449	$2. 514, 941	$2, 072, 909	$1, 898, 843	$1, 680, 292	$1, 792, 726	$15, 065, 344
Clinton	Tons...	40. 000	40, 000	48, 000	61, 389	59, 442	61, 537	55, 238	365, 606
	Value..	60, 000	50, 000	58, 080	73, 360	58, 907	67, 998	41, 429	409, 774
Gallatin	Tons...	80, 400	30, 000	....	30, 400	....	....	....	140, 800
	Value..	101, 150	42, 000	....	35, 036	....	....	....	178, 186
Jackson	Tons...	64, 412	429, 832	192. 826	288, 770	175, 286	251, 644	375, 718	1, 778, 488
	Value..	100, 443	593, 168	215, 965	401, 390	203, 332	241, 327	335, 403	2, 091, 028
Johnson	Tons...	27, 000	27, 000	11, 780	....	....	....	....	65, 780
	Value..	34, 290	34, 290	14, 725	....	....	....	....	83, 305
Marion	Tons...	39, 943	101, 000	120, 000	109, 000	130, 101	109, 434	98, 915	708, 393
	Value..	45, 497	151, 500	147, 600	109, 000	127, 759	104, 509	87, 629	773, 494
Perry	Tons...	222, 186	276, 845	299, 305	255, 868	259, 375	213, 112	319, 552	1, 846, 243
	Value..	227, 343	249, 160	293, 319	250, 751	253, 928	199, 047	280, 471	1, 754, 019
Randolph	Tons, ..	69, 958	186, 267	68. 560	46, 535	61, 124	62, 220	74, 263	568, 927
	Value..	81, 572	160, 190	73, 359	43, 161	55. 745	52, 265	58, 014	524, 306

Saline	Tons	2,320	348,320	270,128	95,967	110,396	69,921	*a* 78,955	976,007
	Value	3,480	470,232	337,660	130,515	129,163	66,495	75,007	1,212,552
St. Clair	Tons	956,265	865,685	790,522	1,067,270	1,202,549	1,012,723	1,018,149	6,913,163
	Value	1,186,909	1,298,527	1,185,783	864,489	952,409	786,886	782,040	7,057,043
Washington	Tons	4,000	4,000	45,000	45,415	47,522	50,072	40,220	236,229
	Value	6,000	6,000	43,650	41,101	41,392	45,716	40,200	224,059
Williamson	Tons	73,500	130,382	144,800	127,615	76,208	116,049	112,338	780,892
	Value	73,500	130,382	144,800	124,106	76,208	116,049	92,533	757,578

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a Product of Johnson and Gallatin counties included.

THE

MINING LAWS OF ILLINOIS,

AS AMENDED BY THE

THIRTY-FIFTH GENERAL ASSEMBLY.

1887.

EXTRACT FROM THE CONSTITUTION OF ILLINOIS.

ARTICLE IV—SECTION 29.

"It shall be the duty of the General Assembly to pass such laws as may be necessary for the protection of operative miners, by providing for ventilation when the same may be required, and the construction of escapement shafts, or such other appliances as may secure safety in all coal mines, and to provide for the enforcement of said laws, by such penalties and punishments as may be deemed proper."

GENERAL MINING LAW.

§ 1. Surveys and maps of mines to be made and kept on file.
§ 2. Inspectors may cause maps to be made at owners cost.
§ 3. *a* Escapement shafts and roadways leading thereto.
  b Communication with contiguous mines.
  c Location of escapement shafts.
  d Time allowed for sinking escapement shafts.
§ 4. *a* Volume of air to be furnished men and animals.
  b Mines to be examined daily.
  c Splitting air currents—Appliances.
  d When unlawful to use furnaces for ventilation.
§ 5. Bore holes.
§ 6. *a* Shafts to be equipped with cages with iron covers, safety catches and brakes.
  b Women, and boys under 14, not to work in mines.
  c Watchmen, duties of—Signals—Lights—What shall be excluded from cages.
  d Code of signals in mines—Management of cages—Additional signals.
  e Penalties.
§ 7. *a* Qualification of engineers and firemen—Loaded cage—Number persons allowed on cage.
  b Inspector to determine number of persons admitted on cage—Velocity.
§ 8. *a* Inspection of boilers.
  b Protection of shaft openings—Steam boilers.
  c Underground engine planes—Signals—Places of refuge.
  d Passage ways at bottom of shafts—Care of sumps.
§ 9. *a* Accidents to be reported to inspectors—Duty of inspectors.
  b Inspectors to investigate all accidents—Powers—Expenses—Failure of persons to report—Penalties.
§ 10. Penalties for violation of mining law.
§ 11. *a* Division of State into inspection districts.
  b Appointment of inspectors—Board of examiners—Term of office.
  c Qualifications of inspectors—Oath—Bond—Salaries.
  d County inspectors—Appointment—Duties—Compensation.
§ 12. *a* Duties of inspectors—Annual reports—Statistics.
  b Removal of inspectors—Complaints—Trial—Vacancies—Costs.
  c Board of examiners—Appointment of—Biennial meetings—Compensation—Right of way for underground connections.
§ 13. *a* Authority of inspectors—May require information.
  b Examination of mines by inspector—Procedure against owners or operators.
§ 14. Recovery of damages for injury to persons or property.
§ 15. Miners and others forbidden to tamper with safety appliances—Punishment.
§ 16. Supply and delivery of props and cap-pieces.
§ 17. Repeal.
§ 18. Mines without escapement shafts—All buildings to be fire proof—Location—Fire apparatus—Neglect—Duty of county inspector.
§ 19. Copper tools to be used—Requirements—Penalty.

An Act *providing for the health and safety of persons employed in coal mines, Approved May 28, 1879, in force July 1, 1879; as amended by acts approved June 18, 1883, and June 21, 1883; in force July 1, 1883; as amended by an act approved June 30, 1885, in force July 1, 1885; and as amended by an act approved June 16, 1887, in force July 1, 1887.*

(The amendments of 1887 appear in italic.)

1. Surveys and Maps to be made.] Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That the owner, or agent, or operator of each and every coal mine in this State, shall make or cause to be made, at the discretion of the inspector, or person acting in that capacity, an accurate map or plan of the workings of such coal mine, and of each and every vein thereof, showing the general inclination of the strata, together with any material deflections in the said workings, and the boundary lines of said coal mines, and deposit a true copy of said map or plan with the inspector of coal mines, to be filed in his office, and another true copy of said map or plan with the recorder of the county in which said coal mine is situated, to be filed in his office, both of which said copies shall be deposited as aforesaid within three (3) months from the day when this act shall go into effect; and the original, or a copy of such map or plan, shall also be kept for inspection at the office of such coal mine; and during the month of January, of each and every year after this act shall go into effect, the said owner, agent or operator, shall furnish the inspector and recorder, as aforesaid, with a statement and further map or plan of the progress of the workings of such coal mine, continued from the last report to the end of the December month just preceding; and the inspector shall correct his map or plan, of said workings, in accordance with the statement and map or plan thus furnished; and when any coal mine is worked out or abandoned, that fact shall be reported to the inspector, and the map or plan of such coal mine, in the office of said inspector, shall be carefully corrected and verified. The several coal mine inspectors in this State, shall furnish copies of all maps or plans of mines, to be filed with the Bureau of Labor Statistics. [As amended by an act approved June 18, 1883, in force July 1, 1883.]

2. Inspector may procure maps at owners cost.] § 2. Whenever the owner, agent or operator of any coal mine shall neglect or refuse to furnish the said inspector and recorder, as aforesaid, with the statement, the map or plan, or addition thereto, as provided in the first section of this act, at the times and in the manner therein provided, the said inspector is hereby authorized to cause an accurate map or plan of the workings of such coal mine to be made at the expense of said owner, agent or operator, and the cost thereof may be recovered by law from said owner, agent or operator, in the same manner as other debts, by suit in the name of the inspector and for his use.

3. Escapement shafts and places of exit—their character—location and construction.] § 3. *a* In all coal mines that are, or have been, in operation prior to the first day of July, 1879, and which are worked by or through a shaft, slope or drift, if there is not already an escapement shaft to each and every said coal mine or a communication between every such coal mine and some other contiguous mine, then there shall be an escapement shaft or such other communication as shall be approved by the mine inspector, making at least two distinct means of ingress and egress for all persons employed or permitted to work in such coal mine. Such escapement shaft or communication with a contiguous mine, as aforesaid, shall be constructed in connection with every vein or stratum of coal worked in such mine, *and all passage ways communicating with the escapement shafts or places of exit, from main hauling ways to the escapement shaft*, shall be at least five feet wide and *five feet* high.

b In all cases where the working face of one mine has by the agreement of adjacent owners been driven into the workings of another mine, the respective owner of such mine while operating the same, shall keep open a roadway at least five feet wide and five feet high, thereby forming a communication as contemplated in this act, and in no case hereafter shall the workings of any mine be driven closer than ten feet to the line of land of any adjacent owner, without the written consent of such owner. And in all cases where the shaft of one mine has been used or may be hereafter used as an air or escapement shaft for another mine, neither owner or operator shall close or obstruct his shaft or workings so as to prevent the use of the same as an escapement or air shaft without first giving one year's notice in writing to the other operator or owner of his intention to abandon his mine. But the operator continuing the working of his mine shall be at the expense of keeping abandoned workings in repair.

c Every escapement shaft shall be separated from the main shaft by such extent of natural strata as shall secure safety to the men employed in such mines, *and before any escapement shaft shall be located, or the excavations for it be begun, the district inspector of mines shall be duly notified to appear and determine what shall be a suitable distance for the same; the distance from main shaft for such escapement shaft shall not be less than 300 feet without the consent of the mine inspector, nor more than 300 feet without the consent of the operator. Such escapement shafts as shall be equipped after the passage of this act shall be supplied with stairways, partitioned off from the main airway, and having substantial handrails and platforms, and such stairways shall be built at an angle not greater than forty-five degrees: Provided, that in lieu of stairways such hoisting apparatus may be substituted as will insure the safe and speedy removal of persons employed in such mines in case of danger. No accumulations of ice shall be permitted in any escapement shaft, nor any obstructions to travel upon any stairways or ladders.*

d The time to be allowed for sinking such escapement shafts as are now required by law, shall be one year for sinking any shaft two hundred feet or less in depth, and one additional year, or pro rata portion thereof, for every additional two hundred feet or fraction thereof. Time shall be reckoned from the the date on which coal is first hoisted from the original shaft for sale or use; and it shall be the duty of the inspectors of mines to see that all escapement shafts are begun in time to secure their completion within the period here specified: And provided *further*, that nothing in this section shall be construed to extend the time heretofore allowed by law for constructing escapement shafts. [As amended by act approved June 16, 1887, in force July 1, 1887.]

4 VENTILATION—THE VOLUME AND DISTRIBUTION OF AIR CURRENTS.] § 4. *a* The owner, agent or operator of every coal mine, whether operated by shaft, slope or drift, shall provide and maintain for every such mine a good and sufficient amount of ventilation for such men and animals as may be employed therein, the amount of air in circulation to be in no case less than one hundred cubic feet for each man, and six hundred cubic feet for each animal, per minute, measured at the foot of the downcast, and the same to be increased at the discretion of the inspector according to the character and extent of the workings, or to the amount of powder used in blasting; and said volume of air shall be forced and circulated to the face of every working place throughout the mine, so that such mine shall be free from standing powder smoke and gases of every kind. Whenever the inspector shall find men working without sufficient air, or under any unsafe conditions, *he shall first give the operator a reasonable notice to rectify the same, and upon his refusal so to do may himself order them out until said portions of said mine shall be put in proper condition.*

b All mines in which men are employed shall be examined every morning by a duly authorized agent of the proprietor, to determine whether there are any dangerous accumulations of gas, or lack of proper ventilation, or obstructions to roadways, or any other dangerous conditions, and no person shall be allowed to enter the mine until such examiner shall have reported all the conditions safe for beginning work. Such examiner shall make a daily record of the condition of the mine in a book kept for that purpose, which shall be open at all times to the examination of the inspector.

c The currents of air in mines shall be split so as to give a seperate current to at least every one hundred men at work, and inspectors shall have discretion to order a separate current for a smaller number of men if special conditions render it necessary. The ventilation required by this section may be produced by any suitable appliances, but in case a furnace shall be used for ventilating purposes, it shall be built in such a manner as to prevent the communication of fire to any part of the works, by lining the upcast with incombustible material for a sufficient distance up from said furnace: *Provided,* it shall not be lawful to use a furnace for ventilating purposes, or for any other purpose, that shall emit smoke into any compartment constructed in, or adjoining any hoisting shaft or slope where the hoisting shaft or slope is the only means provided for the ingress or egress of persons employed in said coal mines.

d That it shall be unlawful, where there is but one means of ingress and egress provided at a coal shaft or slope, to construct and use a ventilating furnace that shall emit smoke into a shaft, as an upcast, where the shaft or slope used as a means of ingress or egress by persons employed in said coal mines is the only means provided for furnishing air to persons employed therein. [As amended by an Act approved June 30, 1885, in force July 1, 1885, and as amended by an Act approved June 16, 1887, in force July 1, 1887.

5. Bore-holes.] § 5. The owner, agent or operator shall provide that bore-holes shall be kept twenty feet in advance of the face of each and every working place, and if necessary, on both sides, when driving towards an abandoned mine or part of a mine suspected to contain inflammable gases, or to be inundated with water.

6. Cages — covers — safety catches and brakes; women and children—watchmen—lights and signals.] § 6. *a* The owner, agent or operator of every coal mine operated by shaft shall provide safe means of hoisting and lowering persons in a cage covered with boiler iron, so as to keep safe, so far as possible, persons descending into and ascending out of such shaft, and such cage shall be furnished with guides to conduct it on slides through such shaft, with a sufficient brake on every drum to prevent accident in case of the giving out or breaking of the machinery; and such cage shall be furnished with safety catches intended and provided as far as possible, to prevent the consequences of cable-breaking or the loosening or disconnecting of machinery.

b No person under the age of fourteen years nor females of any age, shall be permitted to enter any mine to work therein; *and before any boy shall be permitted to work in any mine he shall be required to produce an affidavit from his parent or guardian, sworn and subscribed to before a justice of the peace or notary public, that said boy is fourteen years of age. Such affidavits of all the boys employed in any mine shall be produced upon the demand of the inspector.*

c The owner, agent or operator of every coal mine operated by shaft and by steam power shall place competent persons at the top and bottom of such shaft for the purpose of attending to the signals while men are being lowered into or hoisted out of the mine; they shall be at their post of duty at least thirty minutes before the hoisting of coal is commenced in the morning, and remain at least thirty minutes after the hoisting of coal has ceased at night. It shall also be their duty to see that the men do not carry any tools, timber or material with them on the cage, and that only the proper number of men are allowed upon the cage at one time. A sufficient light shall be furnished at the top and bottom of the shaft to insure as far as possible the safety of persons getting on or off the cage.

d The following code of signals between the top-man, bottom-man and engineer are prescribed for use at all mines operated by shaft and by steam-power:

From the Bottom to the Top.

One bell shall signify to hoist coal or empty cage, and also to stop either when in motion.

Two bells shall signify to lower cage.

Three bells shall signify that men are coming up. When return signal is received from the engineer, men will get on the cage and ring one bell to start.

Four bells shall signify to hoist slowly, implying danger.

From the Top to the Bottom.

One bell shall signify all ready, get on the cage.

Two bells shall signify send away empty cage.

Provided, that the manager of any mine may add to this code of signals in his discretion for the purpose of promoting their efficiency, or the safety of the men, but any code which may be established shall be conspicuously posted at the top and bottom of the shaft and in the engine room.

c Any person neglecting or refusing to perform the duties required to be performed by sections three, four, five, six, seven and eight of this act shall be deemed guilty of a misdemeanor and punished by a fine in the discretion of the court trying the same, subject, however, to the limitations as provided by section ten of this act. [As amended by an act approved June 18, 1883, in force July 1, 1883; and as amended by act approved June 16, 1887, in force July 1, 1887.]

7. ENGINEERS AND FIREMEN—NUMBER OF PERSONS PERMITTED ON CAGES.] § 7. *a* No owner, agent or operator of any coal mine operated by shaft or slope shall place in charge of any engine whereby men are lowered into or hoisted from the mine, any *other than* competent experienced and sober *engineers and firemen, and they shall not be less than eighteen years of age.* No person shall ride upon a loaded cage *or car* used for hoisting purposes in any shaft or slope, and in no case shall more than twelve persons ride on any cage or car at one time, nor shall any coal be hoisted out of any coal mine while persons are descending into such mine.

b The number of persons permitted to ascend out of or descend into any coal mine *at one time* shall be determined by the inspector *and they shall not be* lowered or hoisted more rapidly than six hundred feet per minute. *Whenever a cage load of persons shall come to the bottom to be hoisted out, who have finished their day's work or otherwise been prevented from working, an empty cage shall be given them to ascend, except in mines having slopes or provided with stairways in escapement shafts.* [As amended by an act approved June 16, 1887, in force July 1, 1887.]

8. INSPECTION OF BOILERS—THE PROTECTION OF SHAFT OPENINGS—PLACES OF REFUGE—PASSAGE-WAYS AT THE BOTTOM—SUMPS.] § 8. *a* All boilers used in generating steam in and about coal mines shall be kept in good order, and the agent, owner or operator, as aforesaid, shall have said boilers examined and inspected by a competent boiler maker or other qualified person as often as once every six months, and oftener if the inspector shall deem it necessary, and the result of every such examination shall be certified in writing to the mine inspector.

b The top of each and every shaft, and the entrance to each and every intermediate working vein shall be securely fenced by gates, properly protecting such shaft and entrance thereto; and the entrance to every abandoned slope, air or other shaft shall be securely fenced off; and every steam boiler shall be provided with a proper steam gauge, water gauge and safety valve.

c All underground, self-acting or engine planes, or gangways, on which coal cars are drawn and persons travel, shall be provided with some proper means of signaling between the stopping places and the ends of said planes or gangways, and sufficient places of refuge at the sides of such planes or gangways shall be provided at intervals of not more than *twenty yards, and they shall be not less than six feet wide and six feet in depth, and shall be whitewashed or otherwise distinguished from the surrounding walls.*

d The bottom of every shaft shall be supplied with a traveling-way to enable men to pass from one side of the shaft to the other without passing under or over the cages. All sumps shall be securely planked over so as to prevent accidents to men. [As amended by an act approved June 16, 1887, in force July 1, 1887.]

9. ACCIDENTS IN MINES—DUTY OF INSPECTOR—FAILURE TO REPORT—PENALTY.] § 9. *a* Whenever loss of life, or serious personal injury shall occur by reason of any explosion, or of any accident whatsoever, in or about any coal mine, it shall be the duty of the person having charge of such coal mine to report the facts thereof, without delay, to the mine inspector of the district in which said coal mine is situated; and if any person is killed thereby, to notify the coroner of the county also, or, in his absence or inability to act, any justice of the peace of said county; and the said inspector shall if he deem it necessary from the facts reported, immediately go to the scene of said accident and make such suggestions and render such assistance as he may deem necessary for the safety of the men.

b The inspector shall investigate and ascertain the cause of such explosion or accident, and make a report thereof, which he shall preserve with the other records of his office; and to enable him to make such investigations he shall have the power to compel the attendance of witnesses, and administer oaths or affirmations to them, and the cost of such investigations shall be paid by the county in which such accident has occurred, in the same manner as costs of coroners' inquests are now paid. And the failure of the person in charge of the coal mine in which any such accident may have occurred, to give notice to the inspector or coroner, as provided for in this section, shall subject such person to a fine of not less than twenty-five dollars ($25), nor more than one hundred dollars ($100), to be recovered in the name of the People of the State of Illinois, before any justice of the peace of such county, and such fine, when collected, shall be paid into the county treasury for the use of the county in which any such accident may have occurred, [As amended by an act approved June 18, 1883, in force July 1, 1883.]

10. FINES AND PENALTIES.] § 10. In all cases in which punishment is provided by fine under this act for a breach of any of its provisions, the fine for a first offense shall not be less than fifty dollars ($50), and not more than two hundred dollars ($200), and for the second offense not less than one hundred dollars ($100), or more than five hundred dollars ($500), in the discretion of the court. except as specially provided for in section nine of this act.

11. INSPECTION DISTRICTS—DISTRICT INSPECTORS AND COUNTY INSPECTORS.] § 11. *a* This State shall be divided into five inspection districts, as follows: The first district shall be composed of the counties of Boone, McHenry, Lake, DeKalb, Kane, DuPage, Cook, LaSalle, Kendall, Grundy, Will, Livingston, Kankakee and Iroquois. The second district, the counties of JoDaviess, Stephenson, Winnebago, Carroll, Ogle, Whiteside, Lee, Rock Island, Henry, Bureau, Mercer, Stark, Putnam, Marshall, Henderson, Warren, Knox, Hancock, McDonough, Schuyler, Adams and Brown. The third district, the counties of Fulton, Peoria, Woodford, Tazewell, McLean, Ford, Mason, Cass, Menard, Logan, DeWitt, Piatt, Champaign and Vermilion. The fourth district, the counties of Pike, Scott, Morgan, Sangamon, Calhoun, Greene, Jersey, Madison, Bond, Macoupin, Montgomery, Christian, Fayette, Macon, Moultrie, Shelby, Effingham, Douglas, Coles, Cumberland, Jasper, Edgar, Clark, Crawford, Clay, Richland and Lawrence. The fifth district, the counties of St. Clair, Clinton, Washington, Marion, Jefferson, Wayne, Edwards, Wabash, Hamilton, White, Monroe, Randolph, Perry, Jackson, Franklin, Williamson, Saline, Gallatin, Union, Johnson, Pope, Hardin, Alexander, Pulaski and Massac.

b The Governor shall, upon the recommendation of a board of examiners selected for that purpose, composed of two practical coal miners, two coal operators, and one mining engineer, to be appointed by the Bureau of Labor Statistics of this State, all of whom shall be sworn to a faithful discharge of their duties, appoint five properly qualified persons to fill the offices of inspectors of coal mines of this State, (being one inspector for each district provided for in this act) whose commissions shall be for the term of two years, but they shall at all times be subject to removal from office for neglect of duty, or malfeasance in the discharge of duty, as hereinafter provided for.

c The inspectors so appointed shall have attained the age of thirty years, be citizens of this State, and have a knowledge of mining engineering sufficient to conduct the development of coal mines, and a practical knowledge of the methods of conducting mining for coal in the presence of explosive gases, and of the proper ventilation of coal mines. They shall have had a practical mining experience of ten years, and shall not be interested as owner, operator, stockholder, superintendent or mining engineer of any coal mine during their term of office, and shall be of good moral character and temperate habits, and shall not be guilty of any act tending to the injury of miners or operators of mines during their term of office. They shall be provided by the State with the most approved modern instruments for carrying out the intention of this act. The inspectors, before assuming the duties of their several offices, shall take an oath of office, as provided for by the constitution, and shall be required to enter into a bond to the State in the sum of five thousand dollars ($5,000), with sureties to be approved by the Governor, conditioned upon the faithful performance of their duties in every particular, as required by this act; said bond, with the approval of the Governor endorsed thereon, together with the oath of office, shall be deposited with the Secretary of State. The salaries of the inspectors provided for by this act shall be eighteen hundred dollars ($1,800) per annum each, and the Auditor of Public Accounts is hereby authorized to draw his warrant on the treasury in their favor, quarterly, for the amount specified in this section for the salary of each inspector.

d Provided, that the county board of any county may appoint an assistant inspector for such county, who shall act under the directions of the district inspector in the performance of his duties, and shall receive not less than three dollars ($3), nor more than five dollars ($5) per day, for the time actually employed, to be paid out of the county treasury; and he may be removed by such county board at any time. [As amended by an act approved June 18, 1883, and an act approved June 30, 1885, in force July 1, 1885.]

12. INSPECTORS—THEIR DUTIES AND REMOVAL—BOARD OF EXAMINERS—RIGHT OF WAY UNDERGROUND BETWEEN MINES.] § 12. *a* The inspectors provided for by this act shall devote their whole time and attention to the duties of their office, and make personal examination of every mine within their respective districts, and shall see that every necessary precaution is taken to insure the health and safety of the workmen employed in such mines, and that the provisions and requirements of the mining laws of this State are faithfully observed and obeyed and the penalties of the same enforced. They shall also make annual reports to the Bureau of Labor Statistics of their acts during the year in the discharge of their duties. with their recommendations as to legislation necessary on the subject of mining, and shall collect and tabulate upon blanks furnished by said Bureau all desired statistics of the mines and miners within their districts, to accompany said annual report; they shall also furnish such information as they may have obtained on this subject, when called for, to the State Geologist.

b Upon a petition signed by not less than three reputable coal operators, or ten coal miners, setting forth that any inspector of coal mines neglects his duties, or that he is incompetent, or that he is guilty of malfeasance in office, or guilty of any act tending to the injury of miners or operators of mines it may be lawful for the Bureau of Labor Statistics of this State, to issue a citation to the said inspector to appear, at not less than fifteen days' notice on a day fixed, before them, when the said Bureau shall proceed to inquire into and investigate the allegations of the petitioners; and if the said Bureau find that the said inspector is neglectful of his duty, or that he is by reason of causes that existed before his appointment, or that have arisen since his appointment, incompetent to perform the duties of said office, or that he is guilty of malfeasance in office, or guilty of any act tending to the injury of miners or operators of mines, the said Bureau shall declare the office of inspector of the said district vacant, and a properly qualified person shall be appointed to fill the office in compliance with the provisions of this act; and the cost of said investigation by the said Bureau shall be borne by the removed inspector; but if the allegations of the petitioners are not sustained by the final decision of the said Bureau, the costs shall be paid by the petitioners.

c The board of examiners provided for in section eleven of this act shall be appointed by the Bureau of Labor Statistics, and shall hold their offices for two years. They shall meet biennially at the State capital on the second Monday in September, and special meetings may be called at any time by the Bureau of Labor Statistics when the office of coal mine inspector becomes from any cause vacant. They shall receive as compensation the sum of three dollars ($3) per day, each, for time actually employed in the duties of their office, and actual traveling expenses, to be verified by affidavit: *Provided*, that in no case shall the per diem received by any member of said board exceed the sum of thirty dollars ($30) per annum. The Auditor of Public Accounts is hereby authorized to draw his warrant in favor of each member of the board of examiners at the close of their annual session, for the full amount due them for attending annual and special sessions, and expenses, upon vouchers sworn to by them and approved by the Secretary of the Bureau of Labor Statistics, and the Governor.

d And provided, further, that when two or more coal mines are so located as to allow the said mines to be connected by permanent entries between, and the land or mining rights lying between such mines is owned by any person or persons with whom the owner or owners of said mine or mines are unable to agree for the purchase of the right of way for the connecting entry or entries between such mines, and the right to maintain and use such entry as a connecting entry, such owner or owners of any such coal mine or mines, or either of them, may acquire such right or title in the manner that may be now or hereafter provided for by any law of eminent domain. [As amended by an act approved June 18, 1883, and by an act approved June 30, 1885, and in force July 1, 1885.]

13. AUTHORITY OF INSPECTOR AND MODE OF PROCEDURE.] § 13. *a* It shall be lawful for the inspector, provided for in this act, to enter, examine and inspect any and all coal mines and machinery belonging thereto, at all reasonable times, by day or by night, but so as not to obstruct or hinder the necessary workings of such coal mine, and the owner, agent or operator of every such coal mine is hereby required to furnish all necessary facilities for entering for such examination and inspection, and if the said owner, agent or operator aforesaid shall refuse to permit such inspection or to furnish the necessary facilities for such entry, examination and inspection, the inspector shall file his affidavit setting forth such refusal with the judge of the circuit court in said county in which said mine is situated, either in term time or vacation, or, in the absence of said judge, with the Master in Chancery in said county in which said mine is situated, and obtain an order on such owner, agent or operator so refusing as aforesaid, commanding him to permit and furnish such necessary facilities for the inspection of such coal mine, or to be adjudged to stand in contempt of court and punished accordingly.

b If the said inspector shall, after examination of any coal mine and the works and machinery pertaining thereto, find the same to be worked contrary to the provisions of this act, or unsafe for the workmen therein employed, said inspector shall, through the State's attorney of his county, or any attorney, in case of his refusal to act, acting in the name and on behalf of the State, proceed against the owner, agent or operator of such coal mine by injunction without bond, after giving at least two days' notice to such owner, agent or operator; and said owner, agent or operator shall have the right to appear before the Judge or Master to whom the application is made, who shall hear the same on affidavits, and such other testimony as may be offered in support as well as in opposition thereto; and if sufficient cause appear, the court, or judge in vacation by order, shall prohibit the further working of any such coal mine in which persons may be unsafely employed contrary to the provisions of this act until the same shall have been made safe and the requirements of this act shall have been complied with, and the court shall award such costs in the matter of the said injunction as may be just; but any such proceedings so commenced shall be without prejudice to any other remedy permitted by law for enforcing the provisions of this act.

14. INJURIES—RIGHT OF ACTION—DAMAGES.] § 14. For any injury to person or property, occasioned by any willful violations of this act or willful failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby; and in case of loss of life by reason of such willful violation or willful failure, as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any other person or persons, who were before such loss of life, dependant for support on the person or persons so killed, for a like recovery of damages for the injuries sustained by reason of such loss of life or lives; *not to exceed the sum of five thousand dollars.* [As amended by an act approved June 16, 1887, in force July 1, 1887.]

15. TAMPERING WITH MACHINERY—CARELESSNESS—DISOBEYING RULES.] § 15. Any miner, workman or other person who shall knowingly injure any water-gauge, barometer, air-course or bratice, or shall obstruct, or throw open any air-ways, or carry any lighted lamps or matches into places that are worked by the light of safety lamps, or shall handle or disturb any part of the machinery of the hoisting engine, or open a door in the mine and not have the same closed again, whereby danger is produced either to the mine or those at work therein; or who shall enter into any part of the mine against caution; or who shall disobey any order given in pursuance of this act; or who shall do any willful act whereby the lives and health of persons working in the mine, or the security of the mine, or mines, or the machinery thereof, is endangered, shall be deemed guilty of a misdemeanor, and, upon conviction, shall be punished by fine or imprisonment, at the discretion of the court.

16. PROPS AND CAP-PIECES.] § 16. The owner, agent or operator of every coal mine shall keep a supply of timber *constantly on hand, of sufficient length and dimensions to be used as props and cap-pieces, and shall deliver the same as required, with the miners' empty car,* so that the workmen may at all times be able to properly secure said workings *for their own safety.* [As amended by an act approved June 16, 1887, in force July 1, 1887.]

17. Repealing clause.] § 17. All acts or parts of acts inconsistent with the provisions of this act are and the same are hereby repealed.

18. Mines without escapements—Buildings to be made fire-proof—county inspectors.] § 18. That all mines hoisting coal by steam power from shaft or slope, having no other means of ingress or egress afforded to persons employed therein than by said shaft or slope, shall, within ninety days after July 1st, A. D. 1883, have all engine and boiler-houses roofed and sided with fire-proof materials, and they shall be situated not less than fifty feet from the mouth of the said shaft or slope; that the hoisting derricks erected over said hoisting shaft or near said slope, if enclosed, and all the coal chutes, buildings and constructions within a radius of fifty feet of the mouth of said hoisting shaft or slope, shall be covered and sided with fire-proof materials, and the person in charge, the owners or operators thereof, shall provide a steam pump and have the same conveniently situated, and a sufficient supply of water and hose always ready for use in any part of the buildings, chutes or constructions within a radius of fifty feet of said coal hoisting shaft or slope; and if the person in charge of any such coal shaft or slope shall refuse or neglect to comply with the provisions of this act, then the inspector of coal mines for the county in which the said shafts or slopes are situated, shall proceed, through the State's attorney of his county, or any attorney, in case of his refusal to act, acting in the name and on behalf of the State, against the owner, agent or operator of said shaft or slope, by information without bond, after giving at least two days' notice to such owner, agent or operator; and the said owner, agent or operator shall have the right to appear before the judge or master to whom the application is made, who shall hear the same on affidavits, and such other testimony as may be offered in support as well as in opposition thereto; and if it be found that the owner, agent or operator of said shaft or slope has refused or neglected to comply with the provisions of this act, the court, or judge in vacation, by order, shall prohibit the further working of any such coal shaft or slope until the owner, agent or operator shall have complied with the terms of this act. [An act approved June 21, 1883, in force July 1, 1883.]

19. Copper tools.] § 19. That all miners and employés engaged in mining coal shall use copper needles in preparing blasts in coal and not less than five (5) inches of copper on the end of all iron bars used for tamping blasts of powder in coal, and the use of iron needles and iron tamping bars not tipped with five inches of copper is hereby declared to be unlawful. Any failure on the part of a coal miner or an employé in any coal mine to conform to the terms and requirements of this act shall subject such miner or employé to a fine of not less than five dollars, nor more than twenty-five dollars, with costs of prosecution for each offense, to be recovered by civil suit, before any justice of the peace; said fines, when collected, to be paid into the treasury of the county where the offense was committed, to the credit of the fund provided for the payment of the county inspector of mines. [An act approved June 21, 1883, in force July 1, 1883.]

THE WEIGHING LAW.

§ . Standard scales must be provided.
§ 2. *a* All coal must be carefully weighed—Correct record to be kept for inspection.
  b Weighman—Oath to be posted at scales.
§ 3. *a* Miners may employ check-weighman—Duties of and privileges.
  b Check-weighman — Qualifications — Oath to be posted at scales.
§ 4. Penalty for fraudulent weighing or recording, or connivance therein.
§ 5. Penalties for failure to comply with law, or obstructing its requirements.
§ 6. Repealing clause.

An Act *to provide for the weighing of coal at the mines, and to repeal a certain act therein named.*

1. Scales to be provided.] Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That the owner, agent or operator of every coal mine in this State, at which the miners are paid by weight, shall provide at such mines suitable and accurate scales of standard manufacture for the weighing of all coal which shall be hoisted or delivered from such mines.

2. Weighing of coal—record of weights—weighman.] § 2. *a* All coal so delivered from such mines shall be carefully weighed upon the scales as above provided, and a correct record shall be kept of the weight of each miner's car, which record shall be kept open at all reasonable hours for the inspection of all miners or others pecuniarily interested in the product of such mine.

b The person designated and authorized to weigh the coal and keep such record shall, before entering upon his duties, make and subscribe to an oath before some magistrate or other officer authorized to administer oaths, that he will accurately weigh and carefully keep a true record of all coal delivered from such mine, and such oath shall be kept conspicuously posted at the place of weighing.

3. Check-weighman may be employed by miners—his duties—qualifications—oath.] § 3. *a* It shall be lawful for the miners employed in any coal mine in this State to furnish a check-weighman at their own expense, whose duty it shall be to balance the scales and see that the coal is properly weighed, and that a correct account of the same is kept, and for this purpose he shall have access at all times to the beam box of said scale, and be afforded facilities for the discharge of his duties while the weighing is being performed.

b The agent employed by the miners as aforesaid to act as check-weighman shall be an employé of the person or persons operating the mine, a citizen of the State and county wherein the mine is situated, and shall, before entering upon his duties, make and subscribe to an oath before some officer duly authorized to administer oaths, that he is duly qualified, and will faithfully discharge the duties of check-weighman; such oath shall be kept conspicuously posted at the place of weighing.

4. Fraudulent weighing or recording—penalties.] § 4. Any person, company or firm having or using any scale or scales for the purpose of weighing the output of coal at mines, so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatsoever by reason of which such coal is not correctly weighed or reported in accordance with the provisions of this act; or any weighman or check-weighman who shall fraudulently weigh or record the weights of such coal, or connive at or consent to such fraudulent weighing and recording, shall be deemed guilty of a misdemeanor, and shall upon conviction, for each offense, be punished by a fine of not less than two hundred dollars ($200) nor more than five hundred dollars ($500), or by imprisonment in the county jail for a period not to exceed sixty (60) days, or by both such fine and imprisonment; proceedings to be instituted in any court of competent jurisdiction.

5. Non-compliance with law or obstructing requirements—penalties—exceptions.] § 5. Any person, owner or agent operating a coal mine in this State who shall fail to comply with the provisions of this act, or who shall obstruct or hinder the carrying out of its requirements, shall be fined for the first offense not less than fifty dollars ($50); for the second offense not less than two hundred dollars ($200) or more than five hundred dollars ($500), and for a third offense not less than five hundred dollars ($500), or be imprisoned in the county jail not less than six months nor more than one year: *Provided*, that the provisions of this act shall apply only to coal mines whose product is shipped by rail or water.

6. Repealing clause.] § 6. That an act entitled "An act to provide for the weighing of coal at the mines," approved June 14, 1883, in force July 1, 1883, as amended and approved June 29, 1885, in force July 1, 1885, be and the same is hereby repealed. [Approved June 16, 1887, in force July 1, 1887.]